# Appendix E
## Survey of Dam Safety Programs in Other States

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Survey of Dam Safety Programs in Other States

PREFACE

This Appendix is a summary of present dam safety statutes and regulations, which have been adopted by 48 states (Hawai‘i and Alabama\(^1\) are not included). Although these programs vary in structure, each program has been paraphrased according to a universal format, which highlights the critical provisions of the dam safety regulations in each state. For the purposes of this report, such provisions are distinguished in part due to their inclusion in individual state laws, federal dam safety legislation and model acts, industry guidelines, or the current Hawai‘i dam safety statute and regulations.

The principal goal of each summary is to highlight unique, innovative, or otherwise special provisions of current dam safety law to facilitate the creation and implementation of revised Hawai‘i dam safety regulations. Certain state statutes and regulations that exhibit such provisions, or are comparatively more applicable in scope or subject matter, are cited more frequently in the “Comprehensive Overview of Dam Safety Programs Throughout the United States” section of the main report.

The independent research conducted to compile these summaries was aided considerably by references from the Association of Dam Safety Officials (ASDSO) website\(^2\), the Federal Emergency Management Agency (FEMA), and the Army Corps of Engineers. In conformance with available industry informational guides, these summaries are patterned after the format established by ASDSO. As ASDSO references

\(^1\) Alabama has no dam safety program and no current dam safety legislation as of print date of this report. Individuals from Natural Resources, Catfish Farmers Federation, Alabama Power Company and several other agencies have formed a committee to promote state dam safety legislation. A draft instrument has been written (January 6, 2003), and looks to establish a state-wide inventory of dams and establish permitting and inspection provisions. Alabama Department of Economic & Community Affairs, Office of Water Resources (2006).

were last updated in 2000, and are not adequately inclusive for the purposes of this investigation, extensive research into each individual state dam safety program statutes, rules, regulations, and supplemental materials was conducted, resulting in additional subject matter on each summary and exhaustive synopsis.

The “Pros” and “Cons” reflect a subjective analysis of the strengths and weaknesses in each state’s dam safety legislation. This subjective analysis was entirely within the context of developing revised Hawai‘i dam safety legislation, and is not intended as a criticism of the legislation of other states, which may have different circumstances or priorities.
ALASKA

Summary
[Pros] The laws and rules regulate privately owned and state-owned dams and reservoirs. The department may employ any employees necessary or retain outside engineering consultation to perform its duties. The department must employ a licensed engineer experienced in dam design and construction; at least five (5) years experience in field of civil engineering is required. These rules apply to dams built before statute promulgation. The department must approve engineers employed by a dam owner to conduct department-mandated inspections. Dam hazard classifications may be determined through any information considered relevant by the department. Municipalities, federal agencies, and other state agencies may be contracted to carry out these rules; upon conflict department regulations shall supersede municipality rules governing dam safety. Emergency action plans are required for all Class I and II dams; Class I plans must conform with Federal Emergency Management Agency (FEMA) Federal Guidelines for Dam Safety: Emergency Action Planning for Dam Owners, revised October 1998. The application process to construct, modify, or remove a dam is very thorough; requiring extensive technical specifications, estimates, engineering calculations, application fees, non-refundable application deposits, an engineer-certified cost estimate, and proof of financial security – via performance bond or other financial assurance – to safely manage a dam and pay for any post-dam closure expenses. The fee schedule is based on costs of dam construction, alteration, or removal. Operation and maintenance manuals are required for all regulated dams. The department must grant a ‘certificate of approval’ before any dam construction, alteration, repair, operation, or removal may occur, and are subject to department discretion. Certificates for dam operation may expire, requiring renewal or reapplication, subject to department discretion and authorization to modify such approval to operate. Post-removal monitoring plans are part of the removal process. Dam owners are required to maintain detailed records regarding dam safety, construction, and operation. Dam owners must report to the department, on forms provided by the department, any incidents involving the dam. Inundation maps indicating flooding upon dam failure must be prepared in accordance with FEMA guidelines. “Owner” includes public utilities, or agents, employees, lessees, receivers, or trustees of an owner. A person may bring an action against the state for the recovery of damages caused by an action undertaken by a dam owner that was negligently ordered by the state over the owner's objection.
[Cons] Dam hazard classifications shall be reassessed “periodically.” As part of the extensive application process, financial proof of ability to pay for department inspections, emergency response actions, or dam failure remediation was omitted. Expiration periods of certificates to operate a dam are not specified by statute. The laws and regulations do not specify any spillway requirements or recommendations. The “definitions” sections are last in both the statute and regulations.

Citation and Title
[Administrative Agency] The Department of Natural Resources (DNR)

Jurisdiction/Powers of Department
The Department of Natural Resources (department) regulates, supervises, and inspects the safety of private and state-owned dams and reservoirs to ensure design, construction, enlargement,
alteration, repair, maintenance, operation, and removal is consistent with protection of life and property. A.S. § 46.17.010, 020. A licensed engineer, experienced in dam design and construction, shall be employed by the department to perform department duties. If the department determines a dam or reservoir to be unsafe, the department shall order dam owners to take the actions necessary to protect life and property. A.S. § 46.17.070. The department may also employ other employees necessary or contract with engineering consultants. A.S. § 46.17.020. The department has the power to adopt regulations and issue orders necessary to carry out its duties. A.S. § 46.17.030. A person may not construct, enlarge, repair, alter, remove, maintain, operate, or abandon a dam or reservoir without the approval of the department. A.S. § 46.17.040. The department may order the owner to take action to protect life and property if it determines the dam or reservoir is unsafe, or require the owner to conduct additional inspections, monitoring, studies, or construction (A.S. § 46.17.070, 11 A.A.C. 93.159) and may invoke judicial action to enforce the laws and regulations (AS 46.17.080). The department may take supervisory control of the dam from the owner in emergency situations. 11 A.A.C. 93.163. Owners of dams built before promulgation of these rules shall submit to the department an application for approval, including the required provisions under these rules. 11 A.A.C. 93.167. These rules do not apply to federally owned or operated dams or reservoirs. A.S. § 46.17.100.

**Liability and Immunity**

The laws and regulations "do not relieve the owner of a dam or reservoir of the duties or liabilities incident to the ownership or operation of the dam or reservoir." A.S. § 46.17.120. State liability is addressed in the laws or regulations. A.S. § 46.17.110. A person may not bring an action against the state, the department, or agents or employees of the state, for the recovery of damages caused by the partial or total failure of a dam or reservoir, or by the operation of a dam or reservoir, or by the operation of a dam or reservoir, or by an act or omission in connection with approval of construction, issuance of enforcement orders relating to maintenance or operation of the dam or reservoir, or control or regulation of the dam or reservoir. A person may bring an action against the State for the recovery of damages caused by an action undertaken by a dam owner that was negligently ordered by the state over the owner's objection. A.S. § 46.17.110. The owner is not relieved of any duties or liabilities incident to ownership or operation of a dam or reservoir. A.S. § 46.17.120.

**Definitions/Dam Classifications**

A *dam* is "an artificial barrier, and its appurtenant works, which may impound or divert water and which has or will have an impounding capacity at maximum water storage elevation of 50 acre-feet and is at least 10 feet in height measured from the lowest point at either the upstream or downstream toe of the dam to the crest of the dam; is at least 20 feet in height; or poses a threat to lives and property as determined by the department after an inspection." A.S. § 46.17.900(3). *Dam height* is the maximum vertical distance from the natural bed of the water course the upstream or downstream toe of the barrier, whichever yields the greater measurement, to the top of the barrier; or if the barrier is not across a watercourse, the maximum vertical distance from the lowest elevation of the outside limit of the barrier to the top of the barrier. 11 A.A.C. 93.153. Dams are classified by hazard potential according to the following:

*Class I* for a dam whose failure would, in the opinion of the commissioner, result in probable loss of life, serious hazard to public health, or serious damage to homes, high-value industrial or commercial properties, or major public utilities;

*Class II* for a dam whose failure would result in a possible health hazard, probable loss of high-value property, probable damage to major highways, railroads, or other public utilities, or probable damage to or loss of important salmon spawning habitat as identified by the commissioner of the Department of Fish and Game, but not result in loss of human life;
Class III for a dam whose failure would result in property losses restricted mainly to rural land and buildings and local roads, and would not result in loss of human life or hazard to health. The department shall require the owner to submit – on a form provided by the department – type and height or barrier, name of water body, proposed hazard classification, and other information including maps, photographs, dam failure analysis, and engineering calculations. The department ultimately determines dam hazard classification. 11 A.A.C. 93.157.

a. Abandonment: Not defined.
b. Engineer: Engineers must: (1) have valid certificate of registration as a professional engineer in the branch of civil engineering; (2) at least five years experience in any state as a licensed or registered professional engineer in the branch of civil engineering; and, (3) significant work experience in the design, construction, inspection, and safety of dams.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: A person who owns, controls, operates, maintains, manages, or proposes to construct a dam or reservoirs, and includes a public utility, and the appointed or authorized agents, employees, lessees, receivers, or trustees of an owner.
f. Person: A corporation, company, partnership, firm, association, organization, business trust, or society, as well as a natural person; and includes the state and political subdivisions of the state, including the Alaska Railroad Corp. and the University of Alaska.
g. Repairs: Only a repair that might directly affect the safety of the dam or reservoir, as determined by the department. Does not include “routine maintenance”: any work performed on a dam that is generally of housekeeping nature, and does not affect or have potential to affect the safety of the dam.
h. Spillway: Not defined.

Program Funding
The A.A.C. provides that dam safety program revenues may be generated through program fees charged to affected owners to reimburse department actions for owner oversight. 11 A.A.C. 05.010 (Fees), establishes that in addition to the hourly fee charged under this subparagraph for services not subject to a fixed fee, the department will charge any additional fee necessary to pay for actual and reasonable direct costs under A.S. § 37.10.052 (Fees Levied By Resource Agencies For Designated Regulatory Services; Negotiated Service Agreements) (d), including costs under (14) of this subsection for recordation by the department, and including costs allowable under A.S. §§ 37.10.052 - 37.10.058, for travel, publication, and professional services; however, after the receipt of a request from a prospective applicant and before the filing of an application or request for a regulatory service listed in (iii), (iv), (v), or (x) of this subparagraph and not subject to a fixed fee, the department will provide the applicant a written estimate of the cost for the department to process the application; if the department determines after receiving an application that the department's costs are likely to exceed a prior written department estimate, the department may give the applicant additional written estimates detailing the additional cost for the department to continue processing the application, and may require payment of the appropriate additional fee amount before the department undertakes additional processing; fees required under this subparagraph are set out in enclosed tables.

Fees and Costs
Owners must pay for inspections conducted by dam owner-employed engineers. If an owner fails to perform a mandated inspection or conducts an inadequate inspection, the department shall require dam owners to pay the costs of inspections conducted by the department – including costs of any related dam safety studies or consulting engineers/contractors. A.S. § 46.17.050. The
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department has the authority to issue orders for remedial measures – including outside consultation, emergency response agency action, or retention of other entities – to be performed at the owner's expense. 11 A.A.C. 93.163.

Application fees are required for dam construction, modification, and removal. A non-refundable deposit on the application fee shall be calculated based on preliminary estimates of the application costs. 11 A.A.C. 93.171, 11 A.A.C. 05.010(a). Fees shall be determined accordingly:

- Certificate of approval for a dam constructed before May 31, 1987, $50 for each foot of vertical height of the dam;
- Certificate of approval for dam construction, repair, modification, removal, or abandonment, a fee, based on the cost estimate prepared under 11 AAC 93.171, and according to the following cumulative schedule, but in no case less than $500:
  - For the first $100,000, a fee of two percent of that portion of the estimated cost;
  - For the next $400,000, a fee of one percent of that portion of the estimated cost;
  - For the next $500,000, a fee of one-half of one percent of that portion of the estimated cost;
  - For all costs in excess of $1,000,000, a fee of one-quarter of one percent of that portion of the estimated cost;
- Transfer of a certificate of approval [and operational permit] is $100.

In addition to these project fees, annual water appropriation fees may also apply upon the commissioner’s approval to appropriate under Chapter 15 of the Water Use Act. Such fees are determined by volume of impounded and utilized state waters.

All remedial dam or reservoir work is to be paid for by the owner.

**Permit/Approval Process**

No person may abandon a dam, remove a dam, operate a dam, or begin the construction, enlargement, modification, or repair (except routine maintenance) of a dam without first applying for the commissioner's permission on a form provided by the commissioner, paying the applicable fees under 11 A.A.C. 05.010, and receiving a certificate of approval from the commissioner for the proposed action. Owners may not deviate from department-approved plans. The department may inspect the dam or any work associated with the dam after twenty-four (24) hours’ notice to dam owner. Certificates of approval are only valid during the specified time on the certificate. 11 A.A.C. 93.173. Application for department approval shall follow the comprehensive, sequential process outlined in 11 A.A.C. 93.171, culminating in six (6) submissions to the department: initial information and document package, preliminary design package, detailed design package, final construction package, pre-construction plans, and post-construction plans. The department may modify the approval process and certification provisions at its discretion, order additional information to qualify engineering and other applicant specifications, and reject any phase of the application. Complete plans and specifications must be "prepared by or under the direction of an engineer with appropriate experience in the design, construction, and safety of dams", and shall include proof of water use permits, land use permission or ownership, ability to pay for sustained safe condition of the dam and eventual safe breach, descriptions of unexpected conditions. 11 A.A.C. 93.170. The laws and regulations do not specify any spillway requirements or recommendations 11 A.A.C. 93.163.

Before dam removal or abandonment, a person must apply to the department for a certificate of approval. The application shall include a non-refundable application fee, methods of means to control erosion, safe water release and stabilizing techniques, sediment control, post-closure monitoring plans, and waterway remediation. If only part of the dam is removed, other criteria are applicable 11 A.A.C. 93.172.
**Inspection Process**

The department has the power to make inspections. A.S. § 46.17.050. At least once every five (5) years, the department must inspect every dam subject to regulation – more frequent inspections may be required. The department may require dam owners to inspect their dams according to department standards and using a qualified engineer approved by the department – at owner’s expense. The department may determine the scope of any dam inspection. 11 A.A.C. 93.159.

The owner of a Class I or Class II dam shall perform a periodic safety inspection on the dam at least once every three years. The owner of a Class III dam shall perform a safety inspection on the dam at least once every five years. All inspections required by the regulations must be accomplished at the owner's sole expense. 11 A.A.C. 93.159. A state-approved engineer with sufficient experience in dam design, construction, and safety appropriate for the type of dam inspected must perform the safety inspections. If the commissioner determines that a condition may exist that may affect the safety of a dam, or determines that the owner inspection required by 11 A.A.C. 93.159, has been inadequate, the commissioner may inspect the dam, at the owner's expense. 11 A.A.C. 93.161.

The Department may inspect the dam or any work associated with the dam after twenty-four (24) hours’ notice to dam owner. 11 A.A.C. 93.173.

**Right of Entry**

The department may enter any premises without notice only if it has reason to believe a dam or reservoir is unsafe or presents an imminent threat to life and property. Otherwise, two weeks written notice must be provided before entry onto owner’s property. A.S. § 46.17.060.

**Operation and Maintenance**

Dam owners must report to the department, on forms provided by the department, any incidents involving the dam, including: performance of dam during extreme loading periods, uncontrolled water release, indications of stress, severe deterioration, and modifications or repairs. 11 A.A.C. 93.177.

Operation and maintenance manuals must be prepared and submitted to the department during the application process. Such manuals shall describe the dam inspection protocol and schedule, operating limitations, maintenance procedures for valves, gates, and other equipment, visual inspection checklists, physical dam description, and other information required by the department. 11 A.A.C. 93.197.

**Emergencies/Emergency Action Plans**

In an emergency situation the department will, at the commissioner's discretion, take remedial action that the department determines is necessary to protect life and property from the risks posed by the dam's operation or potential failure. 11 A.A.C. 93.163. The department may take supervisory control of the dam from the owner, over the owner's objection if necessary, until the emergency passes. Dam owner and its employees and agents shall comply with department orders during department control. 11 A.A.C. 93.163.

Emergency action plans (EAP) are required for all Class I and II dams, must be approved by the department, and shall be updated at least annually. EAPs must include emergency response coordination, detailed inundation maps, dam break analysis, scheduled plan revisions according to FEMA guidelines, and other provisions deemed necessary by the department. EAPs must be distributed to all persons with responsibilities identified in the plan. 11 A.A.C. 93.167 and 11 A.A.C. 93.171.
Owner Non-Compliance/Violations/Penalties

Upon refusal to allow department inspection, a search warrant may be sought by the department. Administrative subpoenas may be used to obtain drawings, operational records, or other information sought by the department. A.S. § 46.17.060. The department may seek an injunction or damages – with assistance of the Attorney General – to enforce these rules. A.S. § 46.17.080. The department has the authority to issue orders for remedial measures to be performed at the owner's expense. 11 A.A.C. § 93.163. A person is guilty of a Class A misdemeanor if the person knowingly violates a provision of the laws or regulations, violates a department order, or hinders the department or its agents from performing its duties. Each day constitutes a separate offense. A.S. § 46.17.150.

Recordkeeping

Dam owners must maintain on file, either at dam location or owner’s regular place of business in the state, all records pertaining to safety of the dam, including: construction plans and specifications, engineering reports, drawings, all completed reports, tests and analyses, safety inspection reports, current emergency action plan, current operation and maintenance plan, and all other relevant information. Such records are subject to department review at any time the department considers necessary and shall be maintained as long as the dam is in service or as deemed necessary by the department. 11 A.A.C. 93.175.

Oversight

Final actions of the department are reviewable according to provisions in the Administrative Procedure Act. A.S. § 46.17.090.

Miscellaneous

FEMA guidelines must be followed when specified by the provisions.

a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.

c. Severability
   - The laws and rules do not specifically address severability.

d. Supplemental Reference Materials
   - The laws and rules do not specifically address supplemental reference materials.
ARIZONA

Summary
[Pros] Well-organized and comprehensive regulations, which set forth procedures for application to construct, repair or modify a dam, set standards for design and maintenance of dams, and establish a dam inspection procedure. The regulations include a comprehensive list of 46 definitions. The regulations set forth separate guidelines for the application process based on dam hazard classification and the applicant’s request. (See R12-15-1208 Application to Construct, Reconstruct, Repair, Enlarge, or Alter a High or Significant Hazard Potential Dam; R12-15-1209 Application to Breach or Remove a High or Significant Hazard Potential Dam; R12-15-1210 Application to Construct, Reconstruct, Repair, Enlarge, Alter, Breach, or Remove a Low Hazard Potential Dam; R12-15-1211 Application to Construct, Reconstruct, Repair, Enlarge, Alter, Breach or Remove a Very Low Hazard Potential Dam.) The regulations also set forth with specificity the design requirements for a high, significant, or low hazard potential dam. The regulations require owners of high or significant hazard dams to prepare emergency action plans, which must include a delineation of areas of responsibility of the owner and other parties. The plan must also clearly identify individuals responsible for notifications and declaring an emergency. The law establishes funds to help finance the repair of unsafe dams. The dam repair fund is made up of monies appropriated by the legislature and monies collected from a lien as described under "Emergencies" and is used for emergency remedial work. The dam repair fund also includes inspection fees, filing fees, and principal and interest collected from dam repair loans. This money may be used for loans and grants. The law also gives the director the authority to establish filing fees based on the estimated cost of the dam, safety inspection fees, and other charges.  
[Cons] No glaring statutory weaknesses.

Citation and Title

Jurisdiction/Powers of Department
All dams are under the jurisdiction of the director of water resources. Dams of the state, or any political subdivision thereof, dams of public utilities, and all dams within the state are included within the jurisdiction conferred by this section. A.R.S. § 45-1202. The department may develop and adopt substantive policy statements that serve as dam safety guidelines to aid a dam owner or engineer in complying with this Article. R12-15-1204.  
The law states that it is unlawful to construct, reconstruct, repair, operate, maintain, enlarge, remove, or alter any dam except upon prior approval of the director. The director is responsible for the approval process including adopting and revising rules and issuing general orders to effectuate this law. The director is also directed by law to supervise the operation and maintenance of all jurisdictional dams to safeguard life and property.
The law gives the director the right and responsibility to conduct investigations and assemble data to make a proper review of the design and construction process and may enter private property for such purposes. It also gives the director the ability to issue a notice of noncompliance to prescribed provisions of approval to the owner or construction contractor and can order immediate compliance or can order work stoppage until compliance has been effected and approved by the director. Failure to follow this directive may render the approval revocable. The director can order construction to cease and desist and can order the owner to appear at a hearing before the department to state his case for non-compliance. The decision is then up to the director as to continuation of the project. The director is authorized to take any legal action necessary to enforce these statutory provisions.

**Liability and Immunity**
A.R.S. § 45-1215, states that no action shall be brought or maintained against the state, or any of its departments, agencies or officials thereof, or any of their employees or agents, for damages sustained through the partial or total failure of a dam or its maintenance by reason of control and regulation thereof by any of them pursuant to duties imposed upon them under the provisions of this chapter. Nothing in this article shall relieve the owner or operator of a dam from the legal duties, obligations and liabilities arising from such ownership or operation.

**Definitions/Dam Classifications**
A.R.S. § 45-1201 defines a *dam* as any artificial barrier, including appurtenant works for the impounding or diversion of water, twenty-five feet or more in height or the storage capacity of which will be more than fifty acre-feet, but does not include
(a) any barrier that is or will be less than six feet in height, regardless of storage capacity
(b) any barrier that has or will have a storage capacity of fifteen acre-feet or less, regardless of height
(c) any barrier for the purpose of controlling liquid-borne material
(d) any barrier that is a release-contained barrier
(e) any barrier that is owned, controlled, operated, maintained or managed by the United States Government or its agencies or instrumentalities if a safety program that is as least as stringent as the state safety program applies and is enforced against the agent or instrumentality.  
*Dam height* is defined as the vertical distance from the lowest elevation of the outside limit of the barrier at its intersection with the natural ground surface to the spillway crest elevation.  
*Release contained barrier* is defined as a barrier that has the storage capacity that in the event of a failure would be contained within the property of its owner.

**Hazard Classification Criteria**
The department shall base hazard potential classification on an evaluation of the probable present and future incremental adverse consequences that would result from the release of water or stored contents due to failure or improper operation of the dam or appurtenances, regardless of the condition of the dam.
### Hazard Potential Classification

<table>
<thead>
<tr>
<th>Hazard Potential Classification</th>
<th>Probable Loss of Human Life</th>
<th>Probable Economic, Lifeline, and Intangible Loss</th>
</tr>
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<tbody>
<tr>
<td>Very Low</td>
<td>None Expected</td>
<td>Economic and lifeline losses limited to owner’s property or 100-yr floodplain. Very low intangible losses identified.</td>
</tr>
<tr>
<td>Low</td>
<td>None Expected</td>
<td>Low</td>
</tr>
<tr>
<td>Significant</td>
<td>None Expected</td>
<td>Low to High</td>
</tr>
<tr>
<td>High</td>
<td>Probable – one or more expected</td>
<td>Low to High</td>
</tr>
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</table>

An owner or engineer shall determine the size of a dam by storage capacity or height, whichever results in the larger size.

#### Size Classification

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<th>Category</th>
<th>Storage Capacity (acre-feet)</th>
<th>Height (feet)</th>
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<tbody>
<tr>
<td>Small</td>
<td>50 to 1,000</td>
<td>25 to 40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>Greater than 1,000 and not exceeding 50,000</td>
<td>Higher than 40 and not exceeding 100</td>
</tr>
<tr>
<td>Large</td>
<td>Greater than 50,000</td>
<td>Higher than 100</td>
</tr>
</tbody>
</table>

a. **Abandonment**: Not defined.
b. **Engineer**: A Professional Engineer registered and licensed in accordance with A.R.S. Title 32, Chapter 1, with proficiency in engineering and knowledge of dam technology.
c. **Hazard Potential**: The probable incremental adverse consequences that result from the release of water or stored contents due to failure or improper operation of dam or appurtenances.
d. **Operator**: Not defined.
e. **Owner**: Any person or entity that owns, controls, operates, maintains, manages or proposes to construct or modify a dam.
f. **Person**: Any person, firm, association, organization, partnership, business trust, corporation, company.
g. **Repairs (Alteration or Repair)**: To make different from the originally approved construction drawings and specifications or current conditions without changing the height or storage capacity of the dam or reservoir, except for ordinary repairs and general maintenance as prescribed in R12-15-1217.
h. **Spillway (Spillway Crest)**: The highest elevation of the floor of the spillway along a centerline profile through the spillway.

### Program Funding
The law states that the director may require a surety company bond in amount sufficient to secure the costs to the state in assuming the safety of a dam left partially constructed. This is required when the director questions the financial stability of the owner or contractor or otherwise deems the bond advisable.

The law also establishes funds to help finance the repair of unsafe dams:
The dam repair fund is made up of monies appropriated by the legislature and monies collected from a lien as described under "Emergencies" and is used for emergency remedial work. The dam repair fund also includes appropriate funds, inspection fees, filing fees, and principal and interest collected from dam repair loans. This money may be used for loans and grants (described below). Monies in these funds are exempt from Section 35-190 relating to lapsing of appropriations.

Non-emergency dam repair loans let the director grant loans to dam owners to defray the costs of repair, which are necessary for safety reasons but not emergencies. Loans are for terms of not more than 20 years. The law goes on to prescribe interest rates, contractual arrangements, fund maintenance procedures, and defaulting procedures.

Dam repair grants may be granted for the same purposes as above and may be in addition to the loans.

The regulations set forth that the director may use monies from the dam repair fund to employ any remedial measure necessary to protect human life and property resulting from a condition that threatens the safety of a dam if a dam owner is unable or unwilling to take action.

**Fees and Costs**

The law gives the director the authority to establish filing fees based on the estimated cost of the dam. The fee shall not exceed 2% of this estimated cost. The fee must be paid before consideration of the application. All fees will be deposited in the dam repair fund. The following fee structure has been established by the rules. R12-15-151.

Application filing fee is based on:

1. **Review of plans, studies of dam costs (in dollars):**
   - First $100,000: 2.0%
   - Next $400,000: 1.5%
   - Next $500,000: 1.0%
   - Over $600,000: 0.5%

2. **Safety Inspections**
   - Per inspection: $100
   - Plus, per foot of height: $2

3. **Other Charges**
   - Photocopies: $0.25 each
   - Computer reports: First page of report: $15
   - Additional pages: $0.25 each

Certified "True Copies" $2.75/ Page

**Permit/Approval Process**

An applicant shall obtain written approval from the director before constructing, reconstructing, repairing, enlarging, removing, altering, or breaching a dam. R12-15-1207. Application requirements vary according to the hazard potential of the dam. High or significant hazard dams see R12-15-1208. Low hazard dams see R12-15-1210. Very low hazard dam see R12-15-1211. The department shall review the application as follows: Applications shall be received by appointment. During the appointment, the department shall briefly review the application. Following receipt of an application, the director shall complete an administrative review and notify the applicant in writing whether the application is administratively complete. After finding an application administratively complete, the director shall complete a substantive review and notify the applicant in writing of the director’s approval or disapproval. The director shall not approve an application in less than 10 days from the date of receipt. If the director disapproves the application, the director shall provide the applicant with a statement of the director’s objections. If the applicant fails to file a perfected application within thirty days, the original shall be canceled unless further time is allowed. A.R.S. § 45-1207(B). An approval to construct...
a new dam or repair, enlarge, alter, breach, or remove an existing dam is valid for one year. R12-15-1207(E).

By law, the director must inspect the dam upon completion of construction. If the inspection passes, the approval is made and a license is issued for use (the rules detail this process, R12-15-1214). The approval plan may be revised if, after inspecting the work, he believes amendments, modifications, or changes are necessary.

According to law, the application must be approved in not less than 10 days from receipt nor retained more than 60 days unless more information is needed. Construction must commence within one year of approval and the director must be notified at least 10 days before construction begins. Time frame rules provide limits of 120 days for administrative review, and 60 days for substantive review.

**Inspection Process**

[State] According to law, the director shall inspect after construction, repair, remodeling, or alteration, during operation and maintenance, and upon filing of a legitimate complaint concerning the safety of the dam. The rules specify criteria for the inspection process. R12-15-1219. Guidelines were developed to accompany the rules stating operation and maintenance frequency—they are as follows:

<table>
<thead>
<tr>
<th>Hazard Potential</th>
<th>Storage Dam Inspection Frequency (at least once each)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low – Very low</td>
<td>Five Years</td>
</tr>
<tr>
<td>Significant</td>
<td>Three Years</td>
</tr>
<tr>
<td>High</td>
<td>One Year</td>
</tr>
</tbody>
</table>

A dam safety inspection includes: (1) Review of previous inspections, reports and drawings; (2) Inspection of the dam, spillways, outlet facilities, seepage control, and measurement system; (3) Inspection of any permanent monument or monitoring installations; (4) Assessment of all parts of the dam that are related to the dam’s safety; and (5) A recommendation regarding the safe storage level of the reservoir. The engineer shall submit a safety inspection report that describes the findings and lists actions that will improve the safety of the dam. The report shall include the engineer’s recommendations of the safe storage level.

[Owner] The rules state that the owner is responsible for safety during construction and after completion of the dam and inspection during and after construction, enlargement, repair, alteration, or removal in accordance with the plans and specifications as approved by the director. An owner may provide to the director, at the owner’s expense, a safety inspection report that complies with the requirements of R12-15-1219, in place of an inspection by the department. The owner’s engineer shall notify the director and submit a written summary of the engineer’s qualifications at least 14 days before the scheduled safety inspection.

**Right of Entry**

The director may enter at reasonable times upon private or public property and the owner shall permit such entry, where a dam is located, including a dam under construction, reconstruction, repair, enlargement, alteration, breach, or removal, for any of the following purposes: (a) to enforce the conditions of approval of construction; (b) to inspect a dam; (c) to investigate or assemble data; (d) to ascertain compliance with Article 12. R12-15-1219(F).

**Operation and Maintenance**

Each owner is responsible for the safe design, operation, and maintenance of a dam. The owner shall operate, maintain, and regularly inspect a dam so that it does not constitute a danger to human life or property. The owner of a high or significant hazard potential dam shall provide timely warning to the department and all other persons listed in the emergency action plan of...
problems at the dam. The owner shall develop and maintain effective emergency action plans and coordinate those plans with local officials as prescribed in R12-15-1221. R12-12-1205(A). The owner of a dam shall install, maintain, and monitor instrumentation to evaluate the performance of the dam. R12-12-1205(C). The owner shall perform timely maintenance and ordinary repair of a dam. R12-12-1205(D). If a change in ownership of a dam occurs, the new owner shall notify the department within 15 days after the date of the transaction. R12-12-1205(E).

An owner shall perform general maintenance and ordinary repairs that do not impair the safety of the dam. General maintenance and ordinary repair activities that do not require prior approval of the director include removing brush or tall weeds; cutting trees; exterminating rodents; repairing erosion gullies; grading the surface on the top of the dam embankment; placing additional riprap and bedding on the upstream slope; painting, caulkling, or lubricating metal structures; removing debris; patching to prevent deterioration; replacing worn or damaged parts; and repairing or replacing fences. R12-15-1217. General maintenance and ordinary repair that may impair or adversely affect safety shall be performed in accordance with Article 12. Emergency actions not impairing the safety of the dam may be taken before guidance can be provided by an engineer and do not require prior approval of the director (i.e. lowering reservoir level, placing sandbags, diverting flood waters).

**Emergencies/Emergency Action Plans**

The law requires that the director determine if a dam is dangerous or if floods threaten its safety and can then employ immediate remedial measures to correct the problem. The law goes on to explain exactly what the director can do to the dam in this instance and says that he is in full charge of the dam until it is rendered safe or the emergency has terminated.

The law also states that the director may spend monies from the dam repair fund. A.R.S. § 45-1212.01.

The owner shall conduct frequent observation of the dam, as prescribed in the emergency action plan and as follows: (1) the owner shall increase the frequency of observation when the reservoir is full, during heavy rains or flooding, and following an earthquake; (2) the owner shall report to the Director any condition that threatens the safety of the dam as prescribed in R12-15-1224(A). The owner shall make the report as soon as possible, but not later than 12 hours after discovery of the condition; (3) if dam failure appears imminent, the owner shall notify the county sheriff or other emergency official immediately; (4) the owner is responsible for the safety of the dam and shall take action to lower the reservoir if it appears that the dam has weakened or is in danger of failing.

Each owner of a high or significant hazard potential dam shall prepare, maintain, and exercise a written emergency action plan for immediate defensive action to prevent failure of the dam and minimize any threat to downstream development. R12-15-1221. The emergency action plan shall include a delineation of areas of responsibility of the owner and other parties. The emergency action plan shall clearly identify individuals responsible for notifications and declaring an emergency. The owner shall use the director’s model emergency plan, which is available at no cost, or an equivalent model, for guidance in preparing the emergency action plan. The owner of a dam shall immediately notify the department and responsible authorities in adjacent and downstream communities, including emergency management authorities, of a condition that may threaten the safety of the dam.

**Owner Non-Compliance/Violations/Penalties**

Arizona law defines a violation as failure to follow the law concerning construction, repair, enlargement, alteration, or removal of a dam or failure to carry out an order of the director. The violator is guilty of a class 2 misdemeanor for each day the violation continues.
If the director feels a violation has taken place, he must give the owner written notice to appear at a hearing before the department to show cause why the owner should not be penalized or be directed to cease and desist work. The director is then responsible for all decisions based on the hearing. If the violation continues, the director may retain a temporary restraining order or a permanent injunction from the state superior court.
The law states that a person determined to violate the law may be assessed a penalty not to exceed $1,000 per day of the violation. These monies go to the state general fund. A judge may stay the decision of the director upon appeal on a showing of good cause.
The owner is ultimately responsible for the costs of the remedial work. The law states that a lien shall be put against the owner's property to cover these costs. As he pays back the debt, the money collected goes back to the dam repair fund.

Recordkeeping
The laws and rules do not specifically address recordkeeping.

Oversight
A.R.S. § 45-1210-1211, explains the process by which a petition can be filed against any decision made by the director. It also explains how a board of review is formed to hear the petition.

Miscellaneous
  a. Complaints to Unsafe Conditions - Upon receipt of a written complaint that the person or property of the complainant is endangered by any dam, the director shall inspect such dam unless his records disclose that the complaint is without merit.
  b. Environmental Impact
    - The laws and rules do not specifically address environmental impact.
  c. Severability
    - The laws and rules do not specifically address severability.
  d. Supplemental Reference Materials
    - The laws and rules do not specifically address supplemental reference materials.
ARKANSAS

Summary
[Pros] All dams within the State of Arkansas, except those owned by the U.S. Government and those exempted by Reg. 701.4, must have a valid construction and operation permit issued under the provisions of the regulations. Reg. 701.3. All proposed dams must include a permanent facility for draining the reservoir. Such a conduit shall have a minimum diameter of 12 inches for watershed areas less than one square mile and 18 inches for watershed greater one square mile. Such conduits must be capable of lowering the surface of the reservoir at a rate not less than 2 inches per day (at normal pool) while inflow to the reservoir is twice the annual average daily flow. Reg. 705.7. When the commission considers the permanent upgrading or removal of an inadequate dam, the dam owner may request the commission to consider interim alternatives including, but not limited to, temporary repairs, reservoir dewatering, insurance coverage, and downstream warning/evacuation plans. Consideration shall be given to the time required to overcome economic, physical and legal restraints to upgrading, the prospect of permanent repair, current use of the facility, degree of risk, and public welfare. Reg. 707.3. In addition, upon request by the owner of an existing dam, which does not meet the minimum acceptable standards of the State Regulations, the Chief Engineer may authorize a variance from these criteria. The Chief Engineer’s decision shall consider: (a) consequences of dam failure, (b) the owner’s proposal for reduction of hazards, (c) barriers to upgrading of the structure, and (d) other pertinent factors. Reg. 707.4. Any person applying for a permit shall pay to the commission, an initial dam permit application review fee equal to 1% of the estimated construction cost for the dam, which shall not be less than $100.00 or exceed $1,000.00. Any person obtaining a permit shall pay to the commission a fee equal to 12 cents per acre-foot of water which the dam involved is designed to impound, but not less than $25 nor more than $10,000. The permit shall provide that the owner shall pay the same fee to the commission each year. The dam permit application fees and annual permit fees are deposited in the Arkansas Water Development Fund.

[Cons] No glaring statutory weaknesses.

Citation and Title

[Rules/Regulations] Regulations are found in Rules and Regulations Governing the Arkansas Dam Safety Program (Reg.) 701.1 – 711.6, adopted November 20, 1990.

[Administrative Agency] Arkansas Soil and Water Conservation Commission

Jurisdiction/Powers of Department
The Arkansas Soil and Water Conservation Commission has the power to:
• Promulgate rules, regulations, and orders as needed to perform its duties. A.C.A. § 15-22-205.
• Issue permits for the construction of dams to impound water. Issue certificates of registration of water diverted from streams. And, make allocations among persons taking water from streams during periods of shortage, to the extent and in the manner provided by law. A.C.A. § 15-22-205.
• Require a permit for construction and operation of all dams that exceed 25 feet in height and impound at least 50 acre-feet of water except those owned by the U.S. Government. A.C.A. § 15-22-210 and § 15-22-214.
• Require, upon appeal by a downstream riparian, a permit for dams of any size whose failure would endanger lives or property. A.C.A. § 15-22-214.
• Direct dam owners to make repairs necessary to protect the safety of the dam. A.C.A. § 22-210[2].
• Remove dams or perform necessary repairs to protect safety of dams if the owner fails to perform the same in a timely manner. Costs of such work shall be a lien against the property. A.C.A. § 15-22-210[2].
• Issue subpoenas for any witness to require his attendance and testimony before the commission, and to require the production of any records determined to be material to the question before the commission A.C.A. § 15-22-208.
• Delegate the power to allocate water during times of shortage, as provided in A.C.A. § 15-22-221, to conservation districts and regional water districts.

Liability and Immunity
Under Reg. 701.7, no action shall be brought against the State or the commission or its employees or agents for the recovery of damages caused by the partial or total failure of any dam or reservoir or through the operation of any dam or reservoir upon the grounds that the aforementioned parties are liable by virtue of approval of the dam or reservoir, approval of flood-handling plans, issuance or enforcement of orders relative to maintenance and operation, inspection, control and regulation of the dam, or measures taken to protect against failure during an emergency.
Nothing in the regulations shall be construed to relieve an owner or operator of a dam or reservoir of the legal duties, obligations, or liabilities incident to ownership or operation. Reg. 701.6.

Definitions/Dam Classifications
The term dam is defined in the rules as "any barrier, including one for flood detention, designed to impound liquid volumes. This shall not include highway, railroad or other roadway embankments, including low water crossings that may temporarily detain floodwater, levees designed to prevent inundation by floodwater, or closed dikes to temporarily impound liquids in the event of emergencies."
The term height of dam is defined as "the vertical distance from the effective crest of the dam to the lowest elevation on the downstream toe of the dam, including the natural stream channel."

Hazard Classification Criteria Regs. 705.3 – 705.4, give the criteria for size classifications based on height of dam and impoundment capacity, and hazard classifications, which are used to determine a dam's spillway design or evaluation flood. Reg. 705.5, provides detail on the hydrologic criteria for dams (minimum flood hydrograph) based on hazard classification.

<table>
<thead>
<tr>
<th>Category</th>
<th>Maximum Storage (ac-ft)</th>
<th>Height (Feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>50 to 1000</td>
<td>25-40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1000 and &lt; 50,000</td>
<td>40 and &lt; 100</td>
</tr>
<tr>
<td>Large</td>
<td>50,000</td>
<td>100</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Category</th>
<th>Loss of Human Life</th>
<th>Economic Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>No</td>
<td>Minimal (No significant structures; pastures, woodland, or largely undeveloped land); less than $100,000.</td>
</tr>
<tr>
<td>Significant</td>
<td>No</td>
<td>Appreciable (Significant structures, industrial, or commercial development, or cropland); $100,000 to $500,000.</td>
</tr>
<tr>
<td>High</td>
<td>Yes</td>
<td>Excessive (Extensive public, industrial, commercial, or agricultural development); over $500,000.</td>
</tr>
</tbody>
</table>
a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined.
f. Person: Any natural person, partnership, firm, association, cooperative, municipality, county, public or private corporation, and any state or local government agency.
g. Repairs: Not defined.
h. Spillway: Not defined.

Program Funding
Dam permit application fees and annual fees shall be deposited by the commission in the Arkansas Water Development Fund to be used by the commission as provided by law and shall not be paid into the State Treasury. A.C.A. § 15-22-219.

Fees and Costs
Any application for permitting a proposed dam after March 24, 1993, shall be accompanied by a check for 1% of the estimated construction cost or $100.00, whichever is greater, except that no application shall exceed $1,000.00. Reg. 703.1. Within 45 days of construction completion, the owner must provide to the commission a report of actual construction costs. If the estimated application review fee exceeds the fee based on actual construction costs, the amount equal to the difference will be refunded. If the fee based on construction costs exceeds the estimated application review fee, an amount equal to the difference will be paid to the commission. Reg. 703.3.

[Annual Fee] Any person obtaining a permit shall pay to the commission a fee equal to 12 cents per acre-foot of water which the dam involved is designed to impound [billing volume], but not less than $25.00, nor more than $10,000. The permit shall provide that the same fee shall be paid by that person to the commission each year thereafter during which the dam is maintained, on or before the anniversary date of the issuance of the permit. A.C.A. §15-22-219.

Permit/Approval Process
Preparation of all plans and specifications, and the construction, enlargement, alteration, repair, or removal of dams subject to commission review shall be under the supervision of an engineer registered in Arkansas. Reg. 705.2. A permit for construction is required prior to construction of any dam not exempted from commission authority. Reg. 702.1. Applicants for dam permits must provide all applicable information requested on the form supplied by the commission. Reg. 702.5.

• An operation permit is required before water is deliberately impounded. Operation permits are issued by the Chief Engineer after completion of final inspection, and receipt of a Certificate of Substantial Compliance by the owner's engineer. Reg. 702.2.
• Preliminary plans and hydrologic information must be submitted with the application for permit. (See Reg. 705.5, Table 3 for hydrological criteria for dams.)
• Final plans and specifications must be approved, in writing, by the Chief Engineer prior to the start of construction. Reg. 706.1.
• Before approval or denial of a permit, the commission shall publish a notice describing the proposed dam in local newspapers, and shall conduct a public hearing if requested by citizens. Reg. 702.7 and 702.8, and A.C.A. § 15-22-206.
Inspection Process

[State]
The commission inspects dam sites prior to construction, during critical phases of construction, and after completion of construction. Reg. 706.5. Commission personnel will periodically perform inspections of each permitted dam. Commission inspections are of three types: Maintenance and Operation; Dam Safety Evaluation; and Emergency. The frequency of inspections and evaluations will vary according to the hazard rating, size and condition of the dam. Emergency inspections will be performed when conditions warrant. Reg. 709.2.

[Owner]
Owners are required to inspect their dams annually and after each major storm event. The owner must perform a visual inspection of the dam. Results of such inspections must be summarized on forms supplied by the commission and mailed to the commission office within 10 days of inspection. Reg. 709.1. Any deterioration in the dam or appurtenances must be reported to the commission. Owners have responsibility for remedial work. In the event the owner fails to perform required repairs, the commission shall perform the work, and the costs shall be a lien against the property. A.C.A. § 15-22-210[2].

Right of Entry
The commission may enter property at any time to inspect the dam or site before, during or after construction. A.C.A. § 15-22-2. The owner or owner’s agent must provide commission personnel access to the dam during reasonable working hours for commission inspections. Access during emergency conditions must be available to commission personnel. Reg. 709.3.

Operation and Maintenance
Operation and maintenance must be performed in accord with documents filed by the owner or owner’s engineer in obtaining the dam permit. Reg. 708.1. The owner must maintain vegetation so as to prevent growth on the spillway, crest, upstream or downstream embankments, and within 20 feet of the downstream toe or groin of the dam. Reg. 708.3. All gates, valves and controls must be maintained in operational condition. Operation of each such item must be tested at least annually. Reg. 708.5.

Emergencies/Emergency Action Plans
Upon discovery of a condition, which renders a dam subject to rapid failure, the Executive Director may issue an Emergency Remedial Order describing actions which must be taken to protect life and property. Failure to comply with these orders may result in penalties under Reg. 704.4. The owner must prepare an emergency action plan for all permitted high-hazard dams. Reg. 710.1. Written approval of the Chief Engineer must be obtained for all EAPs. Reg. 710.2. Site conditions will dictate exact contents of specific EAPs. Reg. 710.3. Guidelines for preparation of EAPs available from the commission. Implementation of EAPs must include at least one tabletop exercise per year and one test drill every three years. The commission’s Chief Engineer must be notified at least one week in advance of either procedure.

Owner Non-Compliance/Violations/Penalties
Persons violating Arkansas law or commission orders regarding dam safety are subject to civil penalties of up to $10,000 per day or occurrence, and/or criminal penalties including fines of up to $10,000 per day or occurrence and/or imprisonment for up to six months. Other remedies available to the commission include revocation of any permit or suspension from any program administered by the commission, suit for injunction or damages, or both. A.C.A. § 14-22-204.
Recordkeeping
The applicant (or applicant’s engineer) must retain construction records throughout the life of the dam. The records must include (1) daily log of construction activities; (2) record of personnel and equipment on site; (3) documentation of soil tests such as standard proctor, in-place density, and moisture; (4) documentation of concrete cylinder tests; and (5) copies of all engineering change order and field change notes. Reg. 706.3.
Within 60 days after completion of construction, the owner, or his engineer, shall submit to the Chief Engineer a complete set of record drawings of the project for filing as a permanent record with the commission. Reg. 706.7.
All gate, valve and control test results must be documented in the owner’s permanent records. Reg. 708.5.
The owner must retain documentation of all owner’s inspections, and repairs or modifications to the dam or appurtenances. Reg. 708.7.

Oversight
Any person affected by a rule, regulation, or order by the commission may obtain review of such actions pursuant to the Arkansas Administrative Procedures Act. A.C.A. §§ 15-22-209, 15-25-201.
Persons who believe themselves or their property to be endangered by failure of a dam which his below the size requirements specified in § 701.4, may file a petition requesting that the commission require permitting and compliance with dam safety regulations for that dam. Reg. 701.5. Upon receipt of the petition, an investigation will ensue. A hearing may be held. The commission shall issue an order either approving or denying the petitioner’s request.

Miscellaneous
Any person constructing a dam under permit has the exclusive right to use water from the reservoir created, subject to the obligation to discharge water from the dam as provided in the permit, and shall have the right to exclude all persons from the water impounded by the dam. Minimum downstream releases shall be fixed by the commission to protect downstream water rights and fish and wildlife. A.C.A. § 15-22-210[1] and Reg. 705.6.

a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.
b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.
c. Severability
   - The laws and rules do not specifically address severability.
d. Supplemental Reference Material
   - The laws and rules do not specifically address supplemental reference material.
CALIFORNIA

Summary
[Pros] The term “owner” is liberally and clearly defined to encompass numerous entities who own, control, maintain, operate, manage, or propose to construct a dam, broadening the scope of this Code. “Alterations” must affect the safety of the dam to be regulated. Legislative intent is clearly manifested through police power to give regulation of dams and reservoirs exclusively to the State, not a city or county within its jurisdiction. Dam owners must demonstrate evidence of right to divert or use the water. Supervision over dam maintenance and operation is vested in the Department of Water Resources, Division of Safety of Dams ("department"), though dam owners must notify the department of any sudden, unprecedented, alarming flooding occurrences or circumstances affecting the dam or reservoir. Owners may request department guidance pertaining to approval of dam construction or alterations. The department may employ its own consultation; an established Consulting Board, consisting of three consultants, independently evaluates approval of dams owned by the department. Many diverse factors are considered when determining dam hazard classifications, such as dam height, downstream risks, volume of retained water, seepage, etc. California issues a ‘certificate of approval’ – analogous to a permit – to indicate a dam is safe to impound water within the prescribed limitations. Annual fees are determined according to dam specifications; penalties assessed for delinquent fee payment. The certificate of approval must also be filed with the State Fish and Game Commission. Owners of dams built before enactment of this statute must apply for a certificate of approval with the Department and comply with applicable rules. The department must inspect all dams built prior to enactment of these regulations. “Small dams” are governed under their own provisions within these rules. There are seemingly liberal exemptions for levees, canal obstructions, tanks, or barriers used to impound water for agricultural use, however, like dam owners, owners of such structures must also employ a civil engineer registered in the State to supervise such structures, prepare, and submit inundation maps to local public safety officials and adopt appropriate emergency procedures. Dam owners must submit to the department the name of their employed engineer and appropriate engineer contact information, which then the department must submit such information to the Office of Emergency Services annually. Upon emergencies, the department may take control of a dam or reservoir and recover expenses from the owner. California requires complainants of dam safety issues to pay a deposit for inspection, whereby such deposit is refundable if complaint is warranted, but if unwarranted, the deposit goes to the State Treasury, c/o the Dam Safety Fund.

[Cons] “Barriers” not in excess of six feet in height, regardless of storage capacity, or with a storage capacity not exceeding 15 acre-feet, regardless of height, are not considered “dams” and are exempt from State regulation. The terminology used in granting the State “responsibility” to control the operational and managerial safety of dams is misleading to imply State liability. Recovery of remedial expenses mandates filing in the superior court in which the dam is located, seemingly slowing the recovery process.
Citation and Title
[Administrative Agency] Department of Water Resources, State Water Resources Control Board, Division of Safety of Dams

Jurisdiction/Powers of Department
It is unlawful to construct, enlarge, repair, alter, remove, maintain, or operate any dam without approval from the department.  C.W.C. § 6077.
The Legislature provides for the regulation and supervision of dams and reservoirs exclusively by the State.  C.W.C. § 6025. Under the State, the Department of Water Resources, Division of Safety of Dams, shall have the authority to adopt rules and regulations pertaining to these provisions. When necessary, the department may request the disclosure of information in order to make proper decisions about an action. Supervision of dam maintenance and operation to safeguard life and property is vested in the department, which shall employ whatever remedial means necessary to protect life and property in the event of an emergency or threat of an emergency.  C.W.C. § 6100.
C.C.R. 303, stipulates that the department shall not issue written approval until dam applicant demonstrates legal right to use or divert the affected water, evidenced by entitlement from the State Water Resources Control Board.
Dam owners must employ a civil engineer registered in the State to supervise the structure for the protection of life and property for the full operating life of the structure. The civil engineer must also determine whether or not such dam constitutes a danger to life and property, and must notify the dam owner and recommend appropriate action. Owners must submit to the department the name, business address, and telephone number of each supervising engineer, which then the department must submit such information to the Office of Emergency Services annually.  C.W.C. § 6025.6.
No city or county has authority to regulate or supervise dams or reservoirs in this State, or the construction, maintenance or operation, though cities may regulate dams not falling under State jurisdiction.  C.W.C. § 6026.
C.W.C. § 6027, gives federal jurisdictional power over State.
Findings, orders, and certificates of approval issued by the department are final, conclusive, and binding upon all State agencies, regulatory or otherwise, as to the safety of design, construction, maintenance, and operation of any dam or reservoir.  C.W.C. § 6030.
The department, under police power of the State, shall supervise the construction, alteration of plans, enlargement, alteration, repair, maintenance, operation, and removal of dams and reservoirs for the protection of life and property as provided in these provisions.  C.W.C. §§ 6075, 6076.
Whenever the department determines a dam is endangered by seepage, earth movement, or other conditions that exist or might occur, the department shall order the owner to take action determined necessary to alleviate the danger to life and property.  C.W.C. § 6081.
The department shall inspect all dams built prior to the initial State dam safety regulations, including those that are 90% complete, at the department’s expense.  C.W.C. §§ 6370-6372.
C.C.R. 320, regulates small dams; technical decisions, orders, studies, and other mandates.  C.C.R. 330-333, states that a Consulting Board shall be retained, and at least once every five years review the operational performance of department-owned dams. The Federal Power Commission’s five-year independent review may be substituted if it is comparable to the review required by this article.
Liability and Immunity
The State is not liable for the failure of any dam or reservoir by virtue of approval of the dam or reservoir, the issuance of enforcement orders relative to maintenance or operation, control and regulation of the dam or reservoir, or measures taken to protect against failure during an emergency. C.W.C. § 6028.
Nothing in this part shall be construed to relieve an owner or operator of a dam or reservoir of the legal duties, obligations, or liabilities incident to the ownership or operation of the dam or reservoir. C.W.C. § 6029.

Definitions/Dam Classifications
A *jurisdictional dam* is any artificial barrier that is 1) 6 feet or more in height and with a storage capacity of more than 50 acre-feet, or 2) 25 feet in height with a storage capacity of more than 15 acre-feet. C.W.C. § 6002 and 6003.

*Dam height* is defined as the distance from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the department, or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse, to the maximum possible water storage elevation.

In determining whether or not a dam or reservoir constitutes or would constitute danger to life or property, the department shall take into consideration the possibility of seepage, earth movement, or other conditions which exist or might occur at or in the vicinity of a dam or reservoir and which might endanger the dam or reservoir. C.W.C. § 6081.

Dams are classified as to damage potential (hazard) and condition. This classification is used to determine frequency of inspection and for selection of the return period for hydrology studies.

A weighted point system is used to divide the damage potential into four classifications: extreme, high, moderate, and low. Reservoir capacity, dam height, estimated evacuation and potential damage are the factors used to classify the damage potential. A similar point system is used to classify the condition of the dam as: poor, fair, good, and excellent. Age, general condition, geologic, and seismic setting are the factors evaluated to classify the condition of the dam.

The hazard classification is reevaluated when development occurs downstream and when the condition of the dam changes, either by identifying deficiencies or when alteration/repair work is completed.

Federal dams are excluded from State regulation.

a. **Abandonment:** Not defined.
b. **Engineer:** A civil engineer registered in the State.
c. **Hazard Potential:** Not explicitly defined. The possibility that the dam might be endangered by seepage, earth movement, or other conditions that exist, or might occur, in any area in the vicinity of the dam.
d. **Operator:** Not defined.
e. **Owner:** Any of the following who own, control, operate, maintain, manage, or propose to construct a dam or reservoir: the state and its departments, institutions, agencies, and political subdivisions; every municipal or quasi-municipal corporation; every public utility; every district; every person; the duly authorized agents, lessees, or trustees of any of the foregoing, or court-appointed receivers or trustees of any of the foregoing. “Owner” does not include the United States.
f. **Person:** Not defined.
g. **Repairs (Alterations):** Only such alterations or repairs as may affect the safety of the dam.
h. **Spillway:** Not defined.
Program Funding
All fees, penalties, interest, fines, or charges collected by the department under this division shall be deposited in the Dam Safety Fund, which is hereby established in the State Treasury. C.W.C. § 6308. The money in that fund shall be available to the department, upon appropriation by the Legislature, for the administration of the dam safety program. The department shall adopt a fee schedule to cover department costs in carrying out supervision of dam safety. The fee schedule shall be adjusted to compensate for the under-collection and over-collection of revenue. C.W.C. § 6307.

Fees and Costs
Annual fees shall be assessed at $400.00 per dam plus $110.00, per foot of height (height is defined in the statute). C.W.C. § 6307.
Cost and expense of owner-requested consultation shall be paid by the owner. C.W.C. § 6055. Application fees for permitting are based on the cost of the project and are as follows:

<table>
<thead>
<tr>
<th>Cost</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>First $300,000</td>
<td>3%</td>
</tr>
<tr>
<td>Next $700,000</td>
<td>2%</td>
</tr>
<tr>
<td>Next $1,000,000</td>
<td>1.5%</td>
</tr>
<tr>
<td>Next $1,000,000</td>
<td>1.25%</td>
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<tr>
<td>Next $2,000,000</td>
<td>1%</td>
</tr>
<tr>
<td>Next $2,000,000</td>
<td>0.75%</td>
</tr>
<tr>
<td>Over $7,000,000</td>
<td>0.50%</td>
</tr>
</tbody>
</table>

The minimum charge is $300. The law goes on to explain what happens if the cost estimate and the actual cost of construction are different. An annual fee is charged based on height and is $200 plus $24 per foot. Penalties will be assessed for delinquent annual fees. C.C.R. 315.
No inspection fees are charged since the law requires inspections at State expense.
Any cost or expenses incurred in the emergency remedial means provided in this article shall be recovered from the owner by action brought by the department in the superior court of the county in which the dam is located. C.W.C. § 6113.

Permit/Approval Process
All dam owners – specifically those owning dams built before the statute – must submit an application for department approval. C.W.C. §§ 6250-6253. Construction of any new dam or reservoir or the enlargement of any existing dam or reservoir shall not be commenced until the owner has applied for and obtained from the department written approval of plans and specs, C.W.C. § 6200, with a separate application filed for each dam and reservoir. C.W.C. § 6201. Application for approval to repair, alter, or remove a dam must also be submitted. C.W.C. §§ 6225-6230. The application shall be accompanied by maps, plans, and specs containing pertinent details and dimensions as the department requires. C.W.C. § 6206. (The law goes on to explain the application process in detail with separate instructions for new dams and enlargements as opposed to alterations and removals.)
The department may, if warranted by the dam conditions and upon written notice delivered by mail or in person, amend, modify, change, or revoke any certificate of approval, C.W.C. §§ 6401, 6402, 6403, provided that specifications are provided as to why such permit was disapproved. C.W.C. § 6404. The department may order that no further work be done on the dam until approval is granted. C.W.C. § 6406.
Immediately upon completion of dam construction or alteration, dam owner must give notice to the department. C.W.C. § 6360.
A certificate of approval shall be issued when a dam is found safe to impound water within its prescribed limitations. Such limitations may not be exceeded without a newly issued certificate.
C.W.C. § 6363. This certificate of approval supersedes previously issued certificate of approvals. C.W.C. § 6364. Owners may consult the department, in writing, on any issues pertaining to safety and technical considerations of a dam approval certificate. C.W.C. § 6054. The department may employ its own consultation. C.W.C. § 6053. C.W.C. § 6357, provides that public hearings shall be held prior to department revocation of a certificate of approval, whereby the public may comment on such revocation. The department must notify the certificate holder (dam owner) and the public before certificate revocation. It is unlawful to remove any dam or reservoir except upon approval of the department provided in this part. C.W.C. § 6077.

Inspection Process
The department, from time to time, shall inspect dams and owners at State expense to determine their safety. C.W.C. § 6102. C.W.C. §§ 6120 and 6121, state that the department may make any investigations necessary to facilitate its approval or other decisions. As soon as practicable the dam - as repaired or altered - shall be inspected by the department. C.W.C. § 6362. During the construction, enlargement, repair, alteration, or removal of any dam or reservoir the department shall make continuous or periodical inspections at State expense for the purpose of securing conformity with the approved plans and specifications. C.W.C. §§ 6400-6407. The department shall require the owner to perform at his expense such work or tests as necessary to disclose information sufficient to enable the department to determine safety conditions of dams and reservoirs, and to evaluate whether or not the plans are being followed. C.W.C. §§ 6102, 6400.
C.W.C. §§ 6455 and 6461, address dams built before the 1965 amendment to the Water Code, and require the department to inspect such dams, notify the owner of their obligations under this Code, and require the necessary work, at the owners’ expense, to attain compliance.

Right of Entry
The department or its representatives may enter upon private property as may be necessary in making investigations or inspections and may undertake action to remove violations. C.W.C. § 6080.

Operation and Maintenance
It is unlawful to maintain or operate any dam or reservoir except upon approval of the department provided in this part. C.W.C. § 6077. C.W.C. § 6102, requires dam owners to perform at their expense other work necessary to secure maintenance and operation which will safeguard life and property. A dam will not be considered to be substantially completed or in operation for fee purposes, when determined it has been rendered inoperative on other than a temporary basis. Circumstances describing dam inoperation are listed in C.C.R. 316. C.W.C. §§ 6370-6372, requires dam owners to submit evidence of approved work performed showing safe passage of floods down the previously dammed watercourse. The department shall inspect the area of dam removal to ensure such water passage.

Emergencies/Emergency Action Plans
C.W.C. § 6101, states that dam owner shall fully and promptly advise the department of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence affecting the dam. The department shall immediately employ any remedial means necessary to protect life and property if the dam conditions do not permit time to issue and enforce an order relative to dam maintenance or operation, or if passing or imminent flooding threatens the safety of any dam or
reservoir. C.W.C. § 6110. The department in emergency situations may (a) lower water level (b) completely empty reservoir or (c) take other necessary steps to ensure safety. C.W.C. § 6111. The department shall continue in full control until the dam or reservoir is rendered safe or emergency situation is past. C.W.C. § 6112. The law lists several types of emergency conditions.

**Owner Non-Compliance/Violations/Penalties**
The department may commence an action or proceeding under this article, either by mandamus or injunction, for the purpose of stopping or preventing violations or threatened violations. The law lists the possible violations, which may be punishable. C.W.C. §§ 6150-6157.

C.W.C. § 6425, provides that every person who violates any of the provisions of this part or of any approval, order, rule, regulation, or requirement of the department is guilty of a misdemeanor and punishable by a fine of not more than two thousand dollars ($2,000) or by imprisonment in the county jail not exceeding six months, or both. In the event of a continuing violation each day that the violation continues constitutes a separate and distinct offense.

Any persons who violate any provision of this part or any order, approval, rule, or regulation of the department is guilty of a misdemeanor and is punishable by a fine of not more than $2,000 or by imprisonment in county jail not exceeding six months, or both. C.W.C. §§ 6425, 6426.

Anyone who has knowledge of such violations and fails to notify the department, or who obstructs the department form enforcing their duties, is punishable as provided in this article. C.W.C. § 6427. Any owner who fails to pay the appropriate fees is punishable under this article C.W.C. § 6428.

**Recordkeeping**
The Department Consulting Board, comprised of three consultants, shall make an independent report to the director upon the issuance, modification, or renewal of any certificate of approval for any dam owned by the department. C.W.C. § 6056.

The department may require owners to keep records of maintenance, operation, staffing, and engineering, and geologic investigations and shall issue rules, regulations, and orders to insure that the aforementioned will adequately protect life and property. C.W.C. § 6101.

Copies of all applications for approval must be filed with the State Fish and Game Commission C.W.C. § 6500.

**Oversight**
Nothing in this part shall be construed to deprive any owner of such recourse to the courts, as he may be entitled to under the laws of this State. C.W.C. § 6031. The law has a section on how to file a complaint. (Art. 5)

**Miscellaneous**
California has a "Small Dams Review Board" to deal with administering the dam safety program in regard to dams less than twenty-five feet in height with reservoir storage less than 2,000 acre-feet.

The independent Consulting Board for department-owned dams is also unique.

a. **Complaints to Unsafe Conditions**
   - Upon receipt of written complaint alleging danger from construction, maintenance, or operation of a dam, the department shall inspect unless the facts show the complaint is without merit, unless the complaintant insists and pays for the inspection. C.W.C. § 6391. C.W.C. § 6392, states that if such inspection reveals dangerous conditions, the payment shall be returned to complaintant, however, if the complaint was made without merit, the payment shall be deposited into the State Treasury. C.W.C. § 6393.

b. **Environmental Impact**
- The laws and rules do not specifically address environmental impact.

c. **Severability**
- The laws and rules do not specifically address severability.

d. **Supplemental Reference Materials**
- California publishes several documents including a booklet on the current practices of the department in the supervision of dams and reservoirs and the publication entitled, "Dams within the Jurisdiction of the State of California" published periodically. The law does not set standards for dam design and construction, but the State furnishes the “Guidelines for Design and Construction of Dams in California”.

COLORADO

Summary
[Pros] Well-organized, comprehensive regulations. When available, the statute explains the rationale behind each provision through case law. The statute initially addresses the state-recognized right to store water for later application, provided that such storage is respective to the senior appropriative water rights of others. The statute also authorizes the use of eminent domain to acquire real property necessary to ensure beneficial use of state waters. In promulgating these rules, the State Engineer may utilize historical data, official records, and contemporary technology to determine future flood magnitudes and the probability of reoccurrence. The State Engineer must authorize any alterations affecting the safety of a dam, in writing. Owners are responsible for the safety and maintenance of their dams and reservoirs, and are required to frequently monitor water levels during high rainfall, earthquakes, or other conditions possibly affecting the safety of the dam. Such conditions shall be reported to the State Engineer as soon as possible or immediately if dam failure is imminent. Any costs or expenses recovered by the State from non-compliant owners shall be credited to the emergency dam repair cash fund, to the extent necessary to replenish the account; the general assembly shall make annual appropriations from this account for direct and indirect State Engineer costs incurred in performance of those duties authorized by these rules. The State Engineer must submit annual reports to the general assembly highlighting the activities taken by the State Engineer in performance of the dam safety program. Reservoir recreational activities are secondary to the safety of life and property; all risks shall be mitigated accordingly. Creation or construction of reservoirs not within the jurisdiction of these rules requires notice to the State Engineer prior to construction. If the spillway discharges into an adjacent basin – different than the one in which the dam is located – dam owners must obtain a right-of-way easement for all downstream areas that may be inundated by the reservoir surcharge capacity (spillway discharges). The State Dam Safety Program provides a Dam Safety Manual, numerous application and inspection forms, a recording database, and other tools to facilitate regulatory compliance and promote dam safety. State Dam Safety Rules are available through the Office of the State Engineer. These Rules also carry a severability clause.
[Cons] No inspection fees; only application and review fees.
*Note: Colorado redrafted its Rules and Regulations for Dam Safety and Dam Construction. Proposed effective date: January 2007.

Citation and Title
[Administrative Agency] Department of Natural Resources, Division of Water Resources, Dam Safety Branch

Jurisdiction/Powers of Department
C.R.S. § 37-87-105, empowers the Colorado State Engineer with the authority to review and approve plans and specifications for dams to be constructed in the state, establish rules and regulations by which such plans and specifications shall be prepared and filed, require that the material used and the work of construction be accomplished in accordance with regulations, and
issuer written decisions regarding acceptance of the construction of a dam in order for a dam to become operational.

Other provisions in C.R.S. § 37-87 (107, 108, 108.5, 110), give the State Engineer the following powers: to determine the appropriate schedules for dam inspections and the appropriate amounts of water which are safe to impound in reservoirs; to order the withdrawal of excess water from any reservoir which is overfilled and is deemed to be unsafe; to use any such force as becomes necessary to return reservoirs to safe water levels and to recover any costs incurred in rectifying a failure of compliance by the dam owner. C.R.S. § 37-87-114, also gives the State Engineer power to ask the State Attorney General to commence judicial proceedings against reservoir owners or operators for refusing to obey the directions of the State Engineer as to the construction or safe operation of such reservoirs.

C.R.S. § 37-87-108.5 empowers the State Engineer – prior to judicial review – to take control of any dam within its jurisdiction and employ remedial measures necessary to protect life and property if, in the opinion of the State Engineer, a dam poses a threat to such interests. Any subsequent judicial proceeding shall be accelerated on the court’s calendar and determined immediately. C.R.S. § 37-87-112.

Any person intending to construct a dam which does not fall under jurisdiction of these Rules (i.e. ‘non-jurisdictional’) must submit notice of intent to construct such a dam on forms provided by the State Engineer not less than 10 days prior to construction. Any alterations to jurisdictional dams in order to attain ‘non-jurisdictional’ classification require submittal for approval according to C.C.R. 402-6. Some alterations or breaches of ‘non-jurisdictional’ dams require written notice to the State Engineer.

The State Engineer has authority to determine the safe storage level for every reservoir. Water level adjustments may be made according to the State Engineer’s determination. C.C.R. 402-13. The State Engineer may waive or delay enforcement of the Rules if dam safety will not be affected and the circumstances warrant. C.C.R. 402-20.

In accordance with Colorado Revised Statutes, Rules may be revised by the State Engineer upon discovery of new technological data or submittal by interested parties. C.C.R. 402-23.

**Liability and Immunity**

For liability purposes, persons in control of the physical structure of any dam shall be deemed to be owners unless filings with the State Engineer show otherwise. C.R.S. § 37-87-104.5.

According to C.R.S. § 37-87-102, dealing with the calculation of probable flows or frequency of recurrence, state officials and employees are exempt from liability with respect to an occurrence different than that predicted, if such calculations are made in accordance with principals set forth in the law.

C.R.S. § 37-87-104 specifically exempts dam or reservoir owners from liability in the case of overflow or failure unless such failure is the proximate result of the owner's negligence. Further, stockholder, officers and board of directors of owners are not liable in such cases if the owner has valid and qualified liability insurance, bond or escrow coverage.

Finally, C.R.S. § 37-87-115 grants immunity to the State of Colorado, the State Engineer, his staff or appointees from liability in damages for any act or failure to act in exercise of governmental authority or the pursuance of the provisions of the law.

The owner is responsible for the safety of the dam and shall take action to lower the reservoir if it appears the dam is weakened or in danger of failing. C.C.R. 402-15.B.

Dam owners are also responsible for dam maintenance and operation. C.C.R. 402-15.D.

**Definitions/Dam Classifications**

The rules define a *dam* as a "man-made barrier, together with appurtenant structures, constructed above the natural surface of the ground for the purpose of impounding water." Dam falling under the jurisdiction of the State Engineer's Office program of dam safety are described in
C.R.S. § 37-87-105, (as well as in the Rules) and include: dams which impound water above the elevation of the natural surface of the ground creating a reservoir with a capacity of more than 100 acre-feet, or which create a reservoir with a surface area in excess of 20 acres at the high-water line, or which exceed 10 feet in height measured vertically from the elevation of the lowest point of the natural surface of the ground along the longitudinal center line of the dam up to the bottom of the emergency spillway. Dams are further classified according to size, and the definitions of the Minor, Small, Intermediate, and Large Dams are found in C.C.R. 402-4.

[Hazard Classifications]
[Class I] a dam for which loss of human life is expected in the event of failure.
[Class II] a dam for which significant damage is expected to occur, but no loss of human life is expected in the event of failure.
[Class III] a dam for which loss of human life is not expected, and significant damage to structures and public facilities is not expected in the event of failure.
[Class IV] a dam for which no loss of human life is expected, and which damage will occur only to the dam owner's property in the event of failure. (See C.C.R. 402-4 for more details.)

a. Abandonment: Not defined.
b. Engineer: A Professional Engineer registered and licensed in Colorado in accordance with Colorado State engineering requirements. Owners shall provide an engineer experienced in dam design and construction to work with the State Engineer. CRS § 37-87-107, does state that safety inspections shall be made on all dams by “qualified, experienced personnel”.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Any person or entity that owns, controls, operates a dam, or proposes to construct a dam. For liability purposes, the person actually in control of a dam shall be deemed the “owner”, unless notice of the true owner is filed with the State Engineer.
f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: An appurtenant structure that conducts overflows from a reservoir.
   1. Principal Spillway: Primary or first-used spillway during run-off; usually an open channel designed to pass normal flows.
   2. Emergency Spillway: A spillway designed to pass the hydraulic capacity of a spillway using the routing capacity of the reservoir.

Program Funding
Any costs or expenses recovered by the State from non-compliant owners shall be credited to the emergency dam repair cash fund, to the extent necessary to replenish the account. The general assembly shall make annual appropriations from this account for direct and indirect State Engineer costs incurred in performance of those duties authorized by these rules. The State Engineer must submit annual reports to the general assembly highlighting the activities taken by the State Engineer in performance of the dam safety program.

Fees and Costs
Dam owners shall be responsible for payment of invoices from the State Engineer for safety inspections and construction observations, including actual salary, travel, substance, and itemized extraordinary expenses at prevailing rates for state officers or employees. C.C.R. 402-17. Payment shall not exceed $125.00 per day per dam or reservoir, or $125.00 per day to one owner. Payments are due within thirty (30) days of invoice receipt. Filing fees for examination and filing for each set of plans and specifications are as follows:
- $2.00 per $1,000.00 (or fraction thereof) of the cost estimate; limited to a maximum of $200.00 (Rule 17).

Costs incurred by the State Engineer in rectifying such a violation may be recovered in civil litigation.

**Permit/Approval Process**

C.R.S. § 37-87-105 states that no (jurisdictional) dam shall be constructed or reservoir created in Colorado unless plans and specifications have been filed with the State Engineer and approved according to regulations.

C.C.R. 402-5 describes in detail the requirements for construction or enlargement of jurisdictional dams or reservoirs. Owners proposing to construct or enlarge jurisdictional dams must submit an application package, which shall be prepared by an engineer, and receive approval from the State Engineer before commencing construction. The application package must include all of the following:

1. Application Form
2. Construction Plans
3. Construction Specifications
4. Classification Report
5. Hydrology Report *
6. Geotechnical Report
7. Design Report
8. Instrumentation Plan
9. Cost Estimate, and
10. Filing fees.

*(The Hydrology report includes inflow design requirements and incremental damage analysis, including statutory provisions relating to standards for determining probable future surface water flows - See C.R.S. § 37-87-102 (2) and (3)). Also included are ‘seismic stability criteria’ for earth dams. C.C.R. 402-5.A.

The data required to be included in each of these reports, and detailed instructions regarding their preparation and submittal are contained in C.C.R. 402-5.A, of the Rules and Regulations. The format is included in C.C.R. 402-5.A. Dam Safety Project Review guide was published in September 1994 (revised May 1996) to facilitate the submittal process.

According to C.C.R. 402-6, owners proposing to alter, modify, or repair a dam must also submit an application package and receive approval of plans and specifications (which have been prepared by an engineer) from the State Engineer prior to construction. The same reports required for the application package for construction may be required for an application to alter, modify or repair, but the type and scope of the project determines the amount of information required in such reports. As with C.C.R. 402-5, C.C.R. 402-6, is detailed, referencing ‘engineering manuals’ when technical information is appropriate.

Owners proposing to remove or breach an existing dam must submit application forms and, depending on the Class of the dam involved, either a breach plan or a written notice of intent to breach. C.C.R. 402-7.A.(2) and (3).

C.C.R. 402-8 establishes a five-year expiration period for any application to construct, alter, or remove a dam.

Owners shall provide an engineer experienced in dam design and construction to work with the State Engineer. Upon the receipt of a general plan for construction observation of a Class I dam, the State Engineer may give his approval for construction to start. The engineer charged with the responsibility for observing the construction of the dam must maintain a record of construction, submit construction progress reports to the State Engineer, and notify and get approval from the State Engineer for any changes in the initial plans and specifications. In addition, the State...
Engineer makes observations of the construction at critical points, must be notified of the completion of the construction, and makes a final inspection. C.C.R. 402-9.A.

Similar, but less stringent processes of observation and reporting apply to the construction of Class II, III, and IV dams. These are explained in C.C.R. 402-9.B to 9.D.

Following the receipt of written notification of completion of construction, the State Engineer shall furnish acceptance or denial of approval of water storage. Requirements for the completion report are listed in C.C.R. 402-10, and include As-Constructed plans, filling schedules and rates, instrumentation monitoring plan, and an Emergency Preparedness Plan. C.C.R. 402-11 to 12, explain construction procedures and requirements for non-jurisdictional dams, and general maintenance, repair, and emergency actions that do not require approval of the State Engineer.

Change in dam ownership shall be immediately filed with the State Engineer. C.C.R. 402-15.F.

**Inspection Process**

C.R.S. §§ 37-87-107 to 37-87-114, pertain to the responsibilities of the State in conducting safety inspections of dams and reservoirs. The State Engineer is required to determine the safe storage level of reservoirs by conducting dam safety inspections using qualified experienced personnel as often as he deems necessary. The expenses incurred by the State-appointed inspectors are paid to the State Engineer by dam or reservoir owners. If division engineers find that water is being impounded in a greater amount than that allowed by the State Engineer, the division engineer has the power and duty to withdraw the excess water, and to use force if owners or others interfere with the process. These procedures also apply in the case of dams inspected as a result of a complaint made by persons in danger of suffering a loss in the case of flood and/or dam failure. Costs incurred in rectifying such a violation may be recovered by civil litigation. Rules and regulations pertaining to inspections are contained in C.C.R. 402-13, 14, and 15. C.C.R. 402-13, deals with the determination of and compliance with the safe storage level of a reservoir. C.C.R. 402-14, describes the procedures for safety inspections conducted by an owner's engineer. The State Engineer may utilize an owner's safety inspection report in lieu of a State Engineer's report if the following conditions are met: 1) the engineer retained by the owner to conduct the inspection must meet professional and educational qualifications listed in C.C.R. 402-14.B.; 2) the inspection report must contain information on each aspect of the safety of the dam and outlets in accordance with regulations; and 3) inspections must be conducted annually for Class I and II dams, and once every 5 years for Class III dams. C.C.R. 402-15, lists the owner's responsibilities with regard to the periodic inspection of outlet facilities (including the type and frequency of inspections and the observations required), the procedures for observing and making reports about dams and reporting emergency or threatening situations, the responsibilities of owners regarding installing, maintaining and monitoring the dam's required instrumentation, and for establishing an annual maintenance plan.

An owner may provide their own safety inspection report to the State Engineer regarding safe storage level of the reservoir, provided that owner’s engineer submits written summary of the following qualifications 14 days before inspection: (1) registration as a professional engineer in Colorado; (2) three years experience in the field of dam safety; and (3) actual experience conducting dam safety inspections. C.C.R. 402-14. It is the owner’s responsibility to provide for inspection of outlet facilities on the dam, according to the frequency set forth by C.C.R. 402-15.

**Right of Entry**

Though right of entry is not explicitly provided, C.R.S. § 37-87-108.5, does state that, if the State Engineer determines that conditions of a dam or reservoir are so dangerous to the health and safety of life or property, or the dam is threatened by any large flood, the State Engineer may immediately employ remedial measures necessary to protect such life and property.
Operation and Maintenance

Actions which do not require prior approval from the State Engineer include: brush or weed removal, cutting of trees from embankment, rodent control, repair of erosion gullies, light surface grading of spillway or embankment – provided that freeboard is not reduced, painting or caulking metal structures, removing debris from spillways or channels, patching outlet works, replacing worn or damaged outlet valves, repairing fencing, and work of similar nature and magnitude which does not impair the safety of the dam. No excavation into the embankment shall be permitted for any of the preceding allowable activities. When questions arise, the State Engineer has discretion. C.C.R. 402-12.

C.C.R. 402-15.B states that the owner is responsible for ensuring frequent observation of his dam, unless prohibited by weather or difficulty accessing the dam, especially at times when the reservoir is full, during heavy rains or flooding. When the reservoir level is greater than half the storage capacity, Class I and II dams shall be observed twice a month, Class III dams observed at least once every three months. Observations shall be conducted in accordance to methods acceptable by the State Engineer.

The owner shall establish an annual maintenance plan to ensure maintenance, as identified in C.C.R. 402-12.A., is accomplished. C.C.R. 402-15.D.

The dam owner is responsible for installing, maintaining, and monitoring the minimum instrumentation required by C.C.R. 402-15.C.(1), however, the State Engineer may require additional instrumentation when deemed necessary. The owner is responsible for ensuring such monitoring data is properly recorded and sent to the State Engineer annually. C.C.R. 402-15.C.(3).

Emergencies/Emergency Action Plans

Owners of Class I and II dams are required to prepare, maintain and exercise Emergency Preparedness Plans in accordance with the requirements described in C.C.R. 402-16, and the State Engineer’s model EPP. C.R.S. § 37-87-1085, permits the Colorado State Engineer to employ remedial measures necessary to protect life and property in emergencies. An emergency dam repair cash account is available. Loans must be reimbursed by the owner. C.C.R. 402-16.D.

Owner shall review and update the EPP annually, submitting any changes to the appropriate emergency coordinators as required.


Some emergency actions – usually not serving as permanent solutions – do not require prior approval, such as: stockpiling materials, removing spillway obstructions, lowering the reservoir level via minor releases – large releases require Division approval, plugging leakage entrances on upstream slope, armoring eroding areas, and increasing freeboard by placing sandbags or temporary earthfill on the dam. C.C.R. 402-12.

Conditions which threaten the safety of the dam must be reported to the State Engineer as soon as reasonably possible, after discovery of such conditions. If dam failure appears imminent, the county sheriff (or emergency official) must be promptly notified. C.C.R. 402-15.B.

Owner Non-Compliance/Violations/Penalties

Any costs incurred by the State Engineer to enforce these rules shall be recoverable from the owner. Upon refusal to reimburse the State Engineer, the attorney general may recover such costs and subsequent attorneys fees. All moneys collected will be credited to the emergency dam repair fund for State Engineer use in performance of duties authorized by these rules. C.R.S. § 37-87-108.5.

C.R.S. § 37-87-114, sets forth the penalties for an owner or operator who fails or refuses to obey the directions of the State Engineer regarding the construction or safe operation of a reservoir. A fine of not less than $500.00 may be levied for each offense and each day's continuance after
notification. In addition, the attorney general is authorized to commence proceedings against such owners to secure compliance with orders necessary for public safety.

Recordkeeping
C.R.S. § 37-87-114.4, establishes that the State Engineer shall submit an annual report to the general assembly covering enforcement of this statute. Such reports shall include plan approvals, safety inspections, use of appropriated funds, receipts from inspections, amended or adopted rules and regulations, enforcement orders or proceedings, dam failures, and other data addressing the effectiveness and implementation of the dam safety program.

Construction, alteration, and removal records shall be maintained according to C.C.R 402-5, 6, 7, 8, 9 and 10.

Oversight
Under C.R.S. § 37-87-112, owners may initiate complaints regarding actions taken by the State Engineer (authorized under C.R.S. §§ 37-87-109 and 110 in response to an unsafe dam situation), in the county district court. Such action will then be reviewed in de novo proceeding and a judicial determination made thereon.

Miscellaneous
a. Complaints to Unsafe Conditions
- Upon complaint from persons threatened by unsafe conditions of a dam, the State Engineer may exert control over the dam to mitigate such hazards. C.R.S. § 37-87-109. Expenses to investigate frivolous or bad faith complaints shall be reimbursed to the State Engineer by complainant, evidenced by invoiced expenses. C.R.S. § 37-87-111.

b. Environmental Impact
- The laws and rules do not specifically address environmental impact.

c. Severability
- If any portion of these Rules is found to be invalid, the remaining portion shall be in force C.C.R. 402-22.

d. Supplemental Reference Materials
Model for Preparing a Dam Safety Emergency Preparedness Plan (1997)
Dam Safety Project Review Guide (Second Revision, 1996)
CONNECTICUT

Summary
[Pros] The State has a clearly established schedule, which sets forth the frequency with which periodic inspections of dams should be conducted. The regulations indicate that the Department of Environmental Protection shall conduct the periodic inspections, however, the department is required to notify the owner of the upcoming date for a regularly scheduled inspection. If the department does not receive notice of the owner’s intent to have the owner’s own engineer conduct the regularly scheduled inspection, the department shall go forward with the inspection and charge the owner the appropriate fee for the inspection. The Guidelines for Dam Emergency Operation Plan set forth guidelines for dam surveillance by an owner when a “flood watch” or “flood warning” takes effect. Specifically, emergency operation monitoring by a dam owner should commence when a “flood watch” alert is issued by the National Weather Service for a particular geographic area, or when heavy runoff conditions are experienced at the dam site. The Guidelines set forth inspection steps that should be undertaken at once and at three-hour intervals thereafter, unless the “flood watch” is upgraded to a “flood warning” at which time the dam should be inspected hourly. The observations include (but are not limited to): (1) the rainfall and water level of the impoundment should be measured and recorded; (2) the crest of the dam should be walked to determine if any cracking, settlement, movement or sloughing of the embankments has occurred; (3) the toe of the dam embankment and the abutment contacts should be inspected and all areas of seepage, soft spots, and boils noted (boils are areas of concentrated seepage under pressure which have the ability to remove or “float” away the soil material through which it flows); and (4) all spillway and outlet structures should be checked for accumulation of debris which should be removed as necessary. A written record of the emergency observations must be maintained. The Guidelines also set forth a schedule for downstream warning notification including early notification and final warning procedures. Early warning takes place when local officials are notified that conditions at the dam site exist, which may require the evacuation of downstream residents. A final warning should be initiated when, in the judgment of the inspector, a dam failure is likely and evacuation of the downstream area is necessary. [Cons] Dam safety program funding is not addressed.

Citation and Title
[Statute] Connecticut General Statutes (C.G.S.), Sections 22a-401 through 411.
[Rules/Regulations] Regulations are found in State of Connecticut Regulations (Reg. Sec.) 22a-409-1 through 409-2, Amended Nov. 1985, (Dam Safety Inspection Regulations)
[Administrative Agency] The Dam Safety Section of the Inland Water Resources Division is charged with the responsibility for administration and enforcement of Connecticut’s dam safety laws.

Jurisdiction/Powers of Department
The Commissioner for Environmental Protection (commissioner) has the authority to regulate the safety of dams. The commissioner shall formulate all rules, definitions, and regulations necessary to carry out the provisions of the aforementioned statutes. The commissioner or his authorized representatives, may enter upon private property to make dam safety investigations and may require the owner to furnish plans, specifications and other necessary data, employ staff or enter into agreements with geologists, other engineers, expert consultants, and such assistants as may be necessary to carry out statutory mandates. C.G.S. § 22a-401. The commissioner has the authority to require the owner to make needed repairs, make alterations to a dam, or remove the structure. The commissioner can also order the owner to periodically
inspect a hazardous dam. A performance bond to secure funds for repair, etc. may be required of the owner by the commissioner.
The commissioner has the authority, by law, to carry out the mandate of an order with which the dam owner did not comply, when a clear and present danger to public safety exists. The dam owner can be assessed the costs for actions taken by the commissioner for implementing the actions required by the outstanding administrative order.

**Liability and Immunity**
Nothing in this chapter and no order approval or advice of the commissioner shall relieve any owner or operator of such a structure from his legal duties, obligations and liabilities resulting from such ownership or operations. C.G.S. § 22a-406.
No action for damages sustained through the partial or total failure of any structure or its maintenance shall be brought or maintained against the state, the Commissioner of Environmental Protection, or his employees or agents (amended by P.A. 96-145).

**Definitions/Dam Classifications**
*Dam* means any barrier of any kind whatsoever which is capable of impounding or controlling the flow of water, including but not limited to storm water retention or detention dams, flood control structures, dikes and incompletely breached dams. Reg. Sec. 22a-409-1-a.
The law says that all dams and reservoirs without exception, which might endanger life and property should they fail are regulated by the commissioner of Environmental Protection. All dams are inspected by the state except those impounding less than 3 acre-feet, unless they pose a unique hazard. The regulations specify the dams to be periodically inspected as those dams greater than 25 feet in height impounding more than 15 acre-feet, or those greater than 6 feet and less than 25 feet high impounding more than 50 acre-feet. Class A, Class BB, Class B or C (see below) dams are regulated according to the regulations.
*Dam height* means the vertical distance measured from the crest of the dam to the lowest elevation at the downstream toe of the dam or similar structure. Reg. Sec. 22a-409-1-a.

**Hazard Classification** - Dams are classified by hazard potential. Reg. Sec. 22a-409-2(d).

<table>
<thead>
<tr>
<th>Category</th>
<th>Hazard Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>Negligible Hazard/Class AA</td>
<td>No measurable damage to roadways, land or structures; negligible economic loss.</td>
</tr>
<tr>
<td>Low Hazard/Class A</td>
<td>Damage to agricultural lands, unimproved roadways, with minimal economic loss.</td>
</tr>
<tr>
<td>Moderate Hazard/Class BB</td>
<td>Damage to normally unoccupied storage structures, damage to low volume roadways, moderate economic loss.</td>
</tr>
<tr>
<td>Significant Hazard/Class B</td>
<td>Possible loss of life, minor damage to habitable structures, residences, convalescent homes, etc. Damage to primary roadways and railroads, significant economic loss.</td>
</tr>
<tr>
<td>High Hazard/Class C</td>
<td>Probable loss of life, major damage to habitable structures, residences, convalescent homes, schools, etc. Damage to main highways, great economic loss.</td>
</tr>
</tbody>
</table>

The regulations state that any dam can be reclassified at any time. The classification of a dam shall be reviewed during each subsequent periodic inspection.

- **Abandonment**: Not defined.
- **Engineer**: Not defined.
- **Hazard Potential**: The probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage.
- **Operator**: Not defined.
e. **Owner:** Any individual, firm, partnership, association, syndicate, company trust, corporation, municipality, agency, or political or administrative subdivision of the state, or any other legal entity of any kind holding legal title to the dam.

f. **Person:** Any individual, firm, partnership, association, syndicate, company, trust, corporation, limited liability company, municipality, agency or political or administrative subdivision of the State, or other legal entity of any kind. Conn. Gen. Stat. § 22a-2.

g. **Repairs:** Not defined.

h. **Spillway:** Not defined.

**Program Funding**
The laws and rules do not specifically address program funding.

**Fees and Costs**
A one-time registration fee is charged for all dams according to their height:

<table>
<thead>
<tr>
<th>Height (in feet) Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>Between 5 and 15 $25</td>
</tr>
<tr>
<td>Between 15 and 25 $50</td>
</tr>
<tr>
<td>Greater than 25 $100</td>
</tr>
</tbody>
</table>

Dams less than 5 feet in height must register but no fee is charged.

The fees for inspection made by the State shall be according to the following:

<table>
<thead>
<tr>
<th>Class</th>
<th>Fee</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (low)</td>
<td>$150.00</td>
</tr>
<tr>
<td>BB (moderate)</td>
<td>$150.00</td>
</tr>
<tr>
<td>B (significant)</td>
<td>$250.00</td>
</tr>
<tr>
<td>C (high)</td>
<td>$350.00</td>
</tr>
</tbody>
</table>

**Permit/Approval Process**
Before any person, firm, corporation, or municipality or political subdivision thereof constructs, alters, rebuilds, substantially repairs, adds to, replaces, or removes any such structure, such person, firm, corporation or municipality, or political subdivision thereof shall apply to the commissioner for a permit to undertake such work. The permit application shall be submitted in triplicate (by administrative practice) with the original including the necessary drawings, plans, specifications, and any other data and shall be submitted to the commissioner in the form and to the extent required by him. C.G.S. § 22a-403. A Certificate of Approval for the construction permitted is issued following inspection and approval.

The commissioner also has the authority to suspend, modify or revoke a permit.

**Inspection Process**
[State] The Department of Environmental Protection shall periodically inspect all dams in accordance with the following schedule. These time periods are the maximum time between inspections, more frequent inspections may be performed at the discretion of the commissioner. Reg. Sec. 22a-409-2(b), (c), (e).

[Hazard Class Inspection Frequency]

<table>
<thead>
<tr>
<th>Class</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (low)</td>
<td>10 years</td>
</tr>
<tr>
<td>BB (moderate)</td>
<td>7 years</td>
</tr>
<tr>
<td>B (significant)</td>
<td>5 years</td>
</tr>
<tr>
<td>C (high)</td>
<td>2 years</td>
</tr>
</tbody>
</table>

The commissioner shall notify a dam owner of the upcoming date for a regularly scheduled inspection at least ninety-days before the inspection. If, the commissioner does not receive notification of the owner’s intent to perform the inspection with his or her own engineer thirty-days prior to the date of the scheduled inspection, the commissioner shall inspect the dam and
charge the owner the appropriate fee. If after notification by the owner of his or her intent to perform the inspection, the commissioner does not receive a copy of the inspection report within thirty-days of the scheduled inspection date, the commissioner shall inspect the dam and charge the owner the appropriate fee. Reg. Sec. 22a-409-2(i).
The inspection shall be performed by qualified personnel of the DEP Dam Safety Program with technical training in the inspection of dams and under the supervision of a civil engineer. The commissioner will issue a written report based on the findings of the periodic inspection. The commissioner shall furnish a copy of the written report to the owner.
The law states that the commissioner shall inspect during construction (or require the dam owner to provide inspection) as is necessary and/or may contract out for these services. Costs would then be split with the owner.
The regulations dictate the inspection process for the construction of new dams and includes an inspection schedule specifying different stages of construction where an inspection should take place.
[Owner]
A dam owner may employ the services of a professional engineer registered in the State of Connecticut, experienced in the design, construction, and inspection of dams to inspect the owner's dam according to the same inspection schedule listed above. The owner shall furnish a copy of each completed inspection report in a format determined by the commissioner within thirty- days of the date of the inspection to the Dam Safety Program. A professional engineer registered in the State of Connecticut shall seal the inspection report. If the owner does comply with requirements regarding the use of private engineers for inspection, the State shall periodically inspect the dam according to the following schedule:
[Hazard Class Inspection Frequency]
Class A (low) 20 years
Class BB (moderate) 14 years
Class B (significant) 10 years
Class C (high) 6 years
The year that the commissioner inspects the dam, the owner shall be exempt from conducting his or her own inspection. Reg. Sec. 22a-409-2-f. The fee for inspection by the state will be $350.00 for all hazard classes, except AA class which is exempt from inspection fee. (P.A. 90-231)
The owner or his or her representative shall inspect the dam during and after the occurrence of major flood events to assure that the structure is withstanding the floodwaters safely. The owner shall fully and promptly advise the commissioner of any sudden or unpredicted floods, unusual circumstances or major changes in the condition of the dam. Reg. Sec. 22a-409-2(j).

Right of Entry
The commissioner or his representative may enter upon private property at any time to investigate or inspect any dam.

Operation and Maintenance
Dams found to be unsafe under the inspection program must be repaired by the owner. Depending on the severity of the identified deficiency, an owner is allowed reasonable time to make the required repairs or to remove the dam.

Emergencies/Emergency Action Plans
High and significant hazard dams must have an Emergency Operation Plan (EOP), which is tailored to reflect the dam's particular features and conditions. The EOP should follow guidelines established by the commissioner, and be reviewed at least annually to update personnel assignments, elected official changes, etc. (Dam Emergency Operations Plan Guidelines)
Owner Non-Compliance/Violations/Penalties
Any person, firm, or corporation building, repairing to any extent substantially affecting stability, maintaining or using any such structure without complying with the provisions of this chapter, or failing to build, repair, maintain, or remove any such structure when so ordered or directed by the commissioner under authority of this chapter shall forfeit to the state a sum not to exceed $1000.00 (amended by Public Act 96-145) to be fixed by the courts for each offense. Each day's continuing offense shall be deemed a separate and distinct offense. Reg. Sec. 22a-407.
The commissioner has the right to ask the attorney general to take action when necessary.
If a dam owner fails to make necessary repairs to the subject structure, the department may issue an administrative order requiring the owner to restore the structure to a safe condition and may refer noncompliance with such an order to the Attorney General’s Office for enforcement. As a means of last resort, the commissioner is empowered by statute to remove or correct, at the expense of the owner, any unsafe structures that present a clear and present danger to public safety.

Recordkeeping
The owner of any dam or similar structure shall register on or before July 1, 1984, with the commissioner on a form prescribed by him, the location and dimensions of such dam or structure. The registration shall include:
(1) the name, address and telephone number of the dam owner and operator;
(2) the name of the dam and impoundment;
(3) the present condition of the dam;
(4) whether the low-level outlet is operable;
(5) a map showing the location of the dam;
(6) a description of the materials used in constructing the dam;
(7) the dimensions of the impoundment;
(8) the dimensions of the spillway;
(9) a general description of the level of development in the floodplain below the dam;
(10) a statement of the use(s) of the impounded water;
(11) whether the dam is registered under the Connecticut Water Diversion Policy Act;
(12) a check or money order payable to the DEP, Water Resources Unit for the amount of the registration fee required by C.G.S. § 22a-409(b), as amended; and
(13) other information which the commissioner deems necessary. Regs. Sec. 22a-409-1.

The owner shall maintain a written record of all inspections and maintenance work performed. This record shall include observations made regarding areas of concern on the structure and description of the major and minor repairs performed and materials utilized. Reg. Sec. 22a-409-2(j).

Oversight
The law says that anyone aggrieved by the decision of the commissioner relative to the issuance of a permit or order shall be granted a hearing by the commissioner. Further appeal of the commissioner's administrative decision must be made to the judicial district of Hartford-New Britain at Hartford.

Miscellaneous
The law has a provision for transfer of ownership. The owner must notify the commissioner within 10 days of a transfer of ownership.
Flood control laws give the commissioner authority to negotiate with federal and municipal governments to build needed flood control structures including dams.
Connecticut Department of Environmental Protection will be establishing technical criteria for spillway design with the adoption of technical regulations, but currently generally adheres to the Corps of Engineer's spillway design guidelines.

a. **Complaints to Unsafe Conditions**
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. **Environmental Impact**
   - The law mentions that it is the responsibility of the commissioner to include in the permitting process, consideration of the environmental impacts of a structure on inland wetlands and to consider the need for fish passage facilities in addition to considering the safety of person and property.

c. **Severability**
   - The laws and rules do not specifically address severability.

d. **Supplemental Reference Materials**
   *Dam Emergency Operations Plan Guidelines*
DELAWARE

Summary
[Pros] The law includes a provision granting authority to the Secretary of the Department of Natural Resources and Environmental Control to adopt regulations and standards in conjunction with a regulatory advisory committee.
[Cons] The law concerning dam construction in Delaware is very limited. Presently, no administrative rules or regulations have been established in Delaware. The dam safety laws do not apply to any private owner of a dam who has not executed documents with the department. The laws do not set forth who, the State or the owner, is responsible for inspection of dams. The law simply states that the department “shall require regular inspection of any dam to which this chapter applies . . .” The law does not set forth an inspection schedule, but rather states that regular inspections shall be performed.

Citation and Title
[Statute] Delaware Code Annotated (Del. C.) Title 7. Conservation, Part IV. Agriculture and Soil Conservation; Drainage and Reclamation of Lowlands, Chapter 42. Dam Safety [effective upon specific appropriations; see 74 Del. LAWS, c. 392 § 2.]
[Rules/Regulations] The state currently has no administrative dam regulations.
[Administrative Agency] The Department of Natural Resources and Environmental Control (department).

Jurisdiction/Powers of Department
7 Del. C. §§ 4201-4217 shall apply to any dam which is owned by the State or any county in the State, or any municipality or any quasi-governmental agency of the State that is 25 feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier, or if it is not across a stream channel or watercourse, measured at maximum water storage elevation; or any dam having an impounding capacity, at maximum storage elevation, of 50 acre-feet or more; or any dam that is deemed by the secretary to be a significant or high hazard potential structure due to its location or other physical characteristics. This chapter shall not apply to any dam that is not in excess of 6 feet in height regardless of storage capacity, or any dam having a storage capacity at maximum water storage elevation not greater than 15 acre-feet regardless of height, or any low hazard potential dam constructed prior to the effective date of this legislation. This chapter shall not apply to any private owner of a dam unless such owner executes a document with the department requesting such coverage.
The department may employ or make such agreements with geologists, engineers, or other expert consultants and such assistants, as it deems necessary to carry out the provisions of this chapter. 7 Del. C. § 4215.
No owner shall begin the construction of any dam to which this chapter applies without written approval from the department. 7 Del. C. § 4204.
The secretary shall develop and adopt regulations and standards in conjunction with regulatory advisory committee, appointed by the secretary. 7 Del. C. § 4208

Liability and Immunity
No action shall be brought against the State, the department, or any agent of the department or any employee of the State or the department for damages sustained through the partial or total failure of any dam, mis-operation or its maintenance by reason of any supervision or other action
taken pursuant to or under this chapter. Nothing in this chapter shall relieve an owner or operator of a dam from the legal duties, obligations and liabilities arising from such ownership and operation. 7 Del. C. § 4215.

Definitions/Dam Classifications
7 Del. C. § 4202 defines dam as any artificial barrier, including appurtenant works, with the ability to impound or divert water, wastewater, or liquid-borne materials. The state law does not define dam height.

a. Abandonment: Not defined.
b. Engineer: [supervising engineer] the design engineer who is responsible for conducting dam construction quality assurance inspections in order to certify the construction has been completed in accordance with the approved plans and specifications.
c. Hazard Potential: Defined below.
d. Operator: Not defined.
e. Owner: Includes any of the following who own, control, operate, maintain, manage, or propose to construct, reconstruct, enlarge, repair, alter, remove or abandon a dam or reservoir; the State and its departments, institutions, agencies and political subdivisions; every municipal or quasi-municipal corporation; every public utility; every district; every person; the duly authorized agents, lessees, or trustees of any of the foregoing; and receivers or trustees appointed by any court for any of the foregoing.
f. Person: Any person, firm, association, organization, partnership, business trust, corporation or company.
g. Repairs: Not defined.
h. Spillway: Not defined.

Hazard Potential Classifications
Low Hazard Potential dam: any dam whose failure or mis-operation is unlikely to cause loss of human life, but may cause minor economic and/or environmental losses.
Significant Hazard Potential dam: any dam whose failure or mis-operation will cause possible loss of human life, economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns.
High Hazard Potential dam: any dam whose failure or mis-operation will cause probable loss of human life.

Program Funding
Any fees collected are appropriated to the department to carry out the purpose of the laws.

Fees and Costs
The department may establish an application fee not to exceed $500. The secretary of the department shall report through the annual budget process the receipt, proposed use, and disbursement of these funds.

Permit/Approval Process
Owners intending to construct any dam to which this chapter applies shall file with the department a preliminary application. The application should include a dam break analysis, the dam height, the maximum impounding capacity, purpose, location and determination of hazard class, and other information required by the department. Every owner applying for approval of a dam subject to the provisions of this chapter shall also file with the department a Certificate from a qualified professional engineer, licensed in the State. 7 Del. C. § 4202
Before commencing repair, alteration or removal of any dam to which this chapter applies, application shall be made by the owner for approval by the department. The application shall state the name and address of the owner, shall adequately detail the changes it proposes to affect, impacts or modifications to plans of operation and maintenance and emergency action plans. Maps, plans and specifications shall accompany the application. 7 Del. C. § 4205.

**Inspection Process**
The department shall require regular inspection of any dam to which this chapter applies. The Secretary may adopt, amend, modify, or repeal standards for the inspection of dams as may be necessary for the purposes of this section. 7 Del. C. § 4212.

**Right of Entry**
The department or its agents may enter upon private property to investigate and assemble data as it deems necessary for a proper review and study of the design and construction of any dams, reservoirs and appurtenances to which this chapter applies. 7 Del. C. § 4214.
No person shall refuse entry or access to any authorized representative of the department who requests entry for purposes of inspection, and who presents appropriate credentials, nor shall any person obstruct, hamper or interfere with any representative while in the process of carrying out that representative’s official business. 7 Del. C. § 4217.

**Operation and Maintenance**
The department shall require that dam owners and operators develop, use and update as necessary an operation and maintenance plan which provides guidance and instruction to personnel for the proper operation and maintenance of any reservoir or dam to which this chapter applies to safeguard life and property. The operation and maintenance plan shall be subject to approval by the department. The secretary may adopt, amend, modify or repeal standards for the maintenance and operation of dams as may be necessary for the purposes of this section. 7 Del. C. § 4211.

**Emergencies/Emergency Action Plans**
The department shall require emergency action plans and operation and maintenance plans for high or significant hazard potential dams, and may also require of owners so notified the filing of any additional information it deems necessary. 7 Del. C. § 4204.

**Owner Non-Compliance/Violations/Penalties**
The laws set forth that any person who violates any rule, regulation, order, or condition imposed in an approved document or other provision of this chapter shall be fined not less than $200 or more than $2000 for each offense. Each day that the violation continues shall constitute a separate offense. In addition, any person who intentionally, knowingly, and after written notice to comply, violates any rule, regulation, order, or condition imposed in an approved document or other provision of this chapter shall be fined not less than $500 or more than $10,000 for each offense. Each day the violation continues shall constitute a separate offense. 7 Del. C. 4216.

**Recordkeeping**
The laws do not specifically address recordkeeping.

**Oversight**
Department oversight is implicit throughout the statute.

**Miscellaneous**

a. **Complaints to Unsafe Conditions**
- The laws do not specifically address complaints to unsafe conditions.
b. **Environmental Impact**
   - The laws do not specifically address environmental impact.

c. **Severability**
   - The laws do not specifically address severability.

d. **Supplemental Reference Materials**
   - The laws do not specifically address supplemental reference materials.
FLORIDA

Summary
[Pros] The dam safety statute requires an owner of a dam to file a permit for abandonment of dams. Any abandoned structure not claimed for three years becomes the property of the State. F.S. § 373.426.

[Cons] Dam Safety in Florida is regulated through several rules, which vary by activity and location (i.e. district). The coordination of these regulations is through the Bureau of Mine Reclamation, Technical Support Section. Each district has the authority to promulgate its own dam safety regulations. Thus, each district’s dam safety regulations are different. As such, the regulations are not summarized below. The dam safety statute’s definition of a dam differs from the accepted national standard. The safety statute does not include a provision for hazard class determination, or design standards. There is no requirement for Emergency Action Plans and no authority to adopt rules. The dam safety statute makes no mention of permit fees or program funding. Under the dam safety statute, dam inspections are conducted by the State. The dam safety statute makes no mention of an owner’s responsibility to inspect dams nor does the statute set forth an inspection schedule.

Citation and Title
[Statute] Statutes regarding the Florida dam safety program are found in Florida Statutes (F.S.) 1989, Chapter 373 Part IV, Sections 373.403 through 373.4596 which is entitled, "Management and Storage of Surface Waters".

[Rules/Regulations] Dam Safety in Florida is regulated through several rules, which vary by activity and location (i.e. districts).

[Administrative Agency] The coordination of these regulations is through the Bureau of Mine Reclamation, Technical Support Section.

Jurisdiction/Powers of Department
The Department of Environmental Regulation is responsible for the dam safety program ("department"). F.S. § 373.019. "Water management districts" are also established to regulate dams. F.S. § 373.069. The department may delineate areas within the district wherein permits may be required. The department may require permits for construction and alteration of dams, impoundments, reservoirs and appurtenant works (F.S. § 373.413), and for maintenance or operation of dams. F.S. § 373.416. The department has the power to revoke a permit if it determines that a structure is a danger to the community. F.S. § 373.429. The permitting process for dams is authorized by the same citation as are storm water management structures, which is also under the department's authority. The department has the power to do inspections (F.S. § 373.423.), and may not be refused immediate entry or access to carry out said inspections of permitted dams. F.S. § 373.425. The department may adopt rules as are necessary to carry out the provisions of the law. F.S. § 373.418. The department may order any necessary remedial measures, which are paid for by the owner. F.S. § 373.436. Finally, the department may employ any remedial means to protect life and property during emergencies. F.S. § 373.439. The law is specific in giving the department authority to require dam owners to install and maintain substantial and serviceable head gates. The law also gives the department authority to install an adequate measuring device if the owner does not have it installed. The cost for such installation will be the owners'.

Appendix E 45
Florida
Liability and Immunity
No action shall be brought against the State or district, or any agent or employees of the state or district, for the recovery of damages caused by the partial or total failure of any dam upon the ground that the state or district is liable by virtue of any of the following: approval of the permit for construction or alteration; the issuance or enforcement of any order related to maintenance or operation; control or regulation of dams; or measures taken to protect against failure during emergency. F.S. § 373.443.

Definitions/Dam Classifications
A dam is "any artificial or natural barrier, with appurtenant works, raised to obstruct or impound, or which does obstruct or impound, any of the surface waters of the state." There was nothing is the legislation concerning height and volume definitions. Dam height is not defined in the laws. Dams are not classified by any type of criteria in the laws.

a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined.
f. Person: Not defined.
g. Repairs (Maintenance): Remedial work of a nature as may affect the of any dam, impoundment, reservoir, or appurtenant work or works, but excludes routine custodial maintenance.
h. Spillway: Not defined.

Program Funding
The laws do not specifically address program funding.

Fees and Costs
The laws do not specifically address filing fees.

Permit/Approval Process
A person proposing to construct or alter a dam, impoundment, reservoir appurtenant work, or works shall apply for a permit from the department. F.S. § 373.413. Permit procedures are spelled out in the law. F.S. § 373.413. The law states that the owner must notify the department in writing upon completion of construction. The department may also require an application for a permit for maintenance and operation of a dam. F.S. § 373.416. The plans and specifications must be prepared by a professional engineer. No filing fee or bond structure is stated in the law. Remedial work is to be paid for by the owner. F.S. § 373.439. Within 30 days after receipt of an application for a permit under this part, the department or the water management district shall review the application and shall request submittal of all additional information the department or the water management district permitted by law to require. F.S. § 373.414. A permit shall be approved or denied within 90 days after receipt of the original application, the last item of timely requested additional material, or the applicant’s written request to begin processing the permit application. F.S. § 373.414. Within 30 days after the completion of construction or alteration of any dam, the permittee shall file a written statement of completion with the department. Finally, the department required a permit for abandonment of dams. Any abandoned structure not claimed for three years becomes the property of the State. F.S. § 373.426.
Appendix E

Florida

Inspection Process
[State]
During the construction or alteration of any dam, impoundment, reservoir or appurtenant works, the department shall make, at its expense, periodic inspections as it deems necessary to ensure conformity with the approved plans and specifications included in the permit. F.S. § 373.423. If during construction or alteration, the governing board or department finds that the work is not being done in accordance with the approved plans and specifications as indicated in the permit, it shall give the permittee written notice stating with which particulars of the approved plans and specifications the construction is not in compliance and shall order immediate compliance with such plans and specifications. F.S. § 373.425. Upon completion of the work, the department shall have periodic inspections made of permitted dams to protect public health and safety. F.S. § 373.425.

[Owner]
The laws do not address whether owners must inspect their dams. Even further, the laws do not set forth an inspection schedule of any sort.

Right of Entry
No person shall refuse immediate entry or access to any authorized representative of the governing board or the department who requests entry for purposes of such inspection and presents appropriate credentials. F.S. § 373.423.

Operation and Maintenance
The department may require permits for the operation and maintenance of dams. The permits are to assure that the work complies with the laws. F.S. § 373.416.

Emergencies/Emergency Action Plans
The secretary of the department, or the executive director of the district in concurrence with the department, can employ any remedial measures necessary to protect life and property in emergency situations defined in F.S. § 373.439. F.S. § 252 is the “Emergency Management Act”, which established each department head as the emergency coordination officer, with duties defined in F.S. § 252.365. The department is empowered to determine the requirement for an emergency action plan in each permit. While EAPs are not specifically required for dams, they are generally required through the permit process except for dams in the low hazard category.

Owner Non-Compliance/Violations/Penalties
The department has the power to order for remedial measures be taken at the owner's expense F.S. § 373.439. The department may revoke or modify a permit at any time if it determines that a dam has become a danger to the public health or safety. F.S. § 373.429. Any dam that violates the law or the standards of the department shall be declared a public nuisance. The operation of such a dam may be enjoined by suit by the state or any of its agencies or by a private citizen F.S. § 373.433.
F.S. § 373.409 of the law states that violations of the law regarding installation of measuring devices on dams shall be considered a misdemeanor in the second degree.

Recordkeeping
The laws do not specifically address recordkeeping.

Oversight
Any person whose permit has been revoked may file a written petition for hearing no later than 14 days after notice of revocation or modification is served. If after such order becomes final the owner fails to make the specified alterations or repairs, the governing board or the department
may, in its discretion, cause such alteration or repairs to be made at the owner's expense. F.S. § 373.436.

Miscellaneous
Florida dam safety law is categorized as part of the surface water management plan for the State and therefore many parts of the law talks about surface and ground water quality, wetlands management, and environmental regeneration. The law goes into much detail in this part on management plans and programs for the future. The five water management districts, designated by law, have authority to make their own rules and regulations and guidelines pertaining to each district.

a. Complaints to Unsafe Conditions
- The laws do not specifically address complaints to unsafe conditions.

b. Environmental Impact
- The laws do not specifically address environmental impact.

c. Severability
- The laws do not specifically address severability.

d. Supplemental Reference Materials
- The laws do not specifically address supplemental reference materials.
GEORGIA

Summary
[Pros] Under “Declaration of Purpose” found in the Dam Safety Code, the police powers of the State are granted to the director to protect the health, safety, and welfare of all citizens. State engineers must demonstrate the necessary Georgia training and experience credentials in dam design and inspection. All State dams must be initially inventoried by the director – with hazard classifications assigned for each dam – and at least once every five years thereafter. Local government involvement is facilitated via authorizing the Environmental Protection Division (“division”) to provide technical assistance upon request, and mandate that the director submit to each county the classified dams within. Persons considering dam construction may consult the director for a projected hazard classification prior to construction. Georgia dam safety rules provide specific, detailed permit application procedures and design standards for dams, as well as allowing for director discretion regarding permit conditions. The permit application procedures include requirements for a significant amount of technical information regarding the dam, its location, and design, and construction elements. The division shall provide permit forms. Transfer of dam ownership or proposed changes to dam operation require division notification in writing. Dam owners are responsible for routine dam inspections, guided by the detailed requirements in the Rules, and must immediately report to the division any symptoms of dam failure including cracks, seepage, settlement, erosions, overflow, or movement. Earthen embankments serving as dams must be protected from surface erosion by appropriate vegetation, concrete, or other protective surfaces (large trees may be deemed inappropriate due to unstable root-soil structure). Spillway systems must be test operated annually. Standards for the design and evaluation of dams are encouraged to be determined through federal intra-agency research and consultation. Violations issued by the division or an administrative law judge carry equal enforceability as if rendered by a court of law; jurisdiction where such issuances can be ordered is addressed, as is the injunctive relief process. Criminal and civil penalties are available.
[Cons] Only two dam categories (Category I and Category II) limits hazard classification scope. Dam inspection intervals/frequencies are not clearly stated – for either dam owners or the division. Program funding is not addressed in the dam safety laws. Emergency action plans are not required.

Citation and Title
[Rules/Regulations] Environmental Protection Division, Department of Natural Resources, Chapter 391-3-8 (“Rule”), last amended in 1998.
[Administrative Agency] Environmental Protection Division, Department of Natural Resources, Board

Jurisdiction/Powers of Department
C.G.A. § 12-5-373 provides the director of the Environmental Protection Division, Department of Natural Resources with general power over the administration of the dam safety program, to require reports and supervise investigations, and to enter into necessary contracts. Powers and duties of the Board of Natural Resources are listed in C.G.A. § 12-5-374, and include the power to "establish by rule or regulation such policies, requirements or standards governing the construction, operation and maintenance of dams or artificial barriers." The board may also establish rules regarding the criteria to be included in dam construction and operation application.
forms, as well as the standards necessary to govern the inspection program. C.G.A. § 12-5-375 authorizes the director to consult the Army Corps of Engineers to determine dam hazard classifications, conduct dam investigations as deemed necessary, and provide technical assistance to local governments upon request. Upon possible dam reclassification, owner shall be notified and may, within ten days, request an inspection to confirm reclassification. The director is responsible for annually submitting information of each dam (by category) to each county clerk, along with dam location, owner name, and owner address. The clerk shall keep these records in an easily accessible location. C.G.A. § 12-5-375.

Various sections of the statutes address the director's powers to approve or disapprove applications for construction permits (C.G.A. § 12-5-376), classify or reclassify dams into hazard categories (including before initial dam construction) (C.G.A. § 12-5-375), revoke, suspend, or modify permits (C.G.A. § 12-5-376(j)), issue administrative orders requiring owners to undertake maintenance and repairs deemed necessary at the owner's expense (C.G.A. § 12-5-378), and to approve or disapprove applications for the removal of a dam (C.G.A. § 12-5-377). Spillway size and corresponding hazard classification can be adjusted according the director. C.G.A. § 12-5-378 empowers the director or any authorized agency to inspect dams and to "enter on any property, public or private at reasonable times without notice for the purpose of accomplishing such inspection."

The Department of Transportation is authorized to contract with the division for the purposes of carrying out this part. C.G.A. § 12-5-383.

**Liability and Immunity**

C.G.A. § 12-5-383 addresses the sovereign immunity of the State, the board, and the division, stating that no action shall be brought against the State, nor any employee of the State for damages sustained through the partial or total failure of any dam or other artificial barrier or its maintenance by reason of any supervision or other action taken or not taken pursuant to C.G.A. §12-5-375.

Nothing shall relieve the owner or operator of a dam of the legal duties, obligations, or liabilities incident to the ownership or operation of the dam.

**Definitions/Dam Classifications**

Definitions are found in C.G.A. § 12-5-372A and in Rule 391-3-8-.02. The term *dam* is defined as "any artificial barrier, including appurtenant works, which impounds or diverts water, and which is twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit to the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation or stores one hundred acre-feet or more". Exceptions include some federal dams, and those less than 6 feet in height regardless of storage capacity or which have storage capacity of less than 15 acre-feet regardless of height. See also Rule 391-3-8-.04.

Dams classifications are found in C.G.A. § 12-5-375(a) and in Rule 391-3-8-.03. Dams are classified by the director into one of two categories: *Category I dams* are those for which improper operation or dam failure would result in probable loss of human life. Situations constituting 'probable loss of life' are those situations involving frequently occupied structures or facilities, including but not limited to, residences, commercial and manufacturing facilities, schools, and churches." *Category II dams* are those for which improper operation or dam failure would not be expected to result in probable loss of human life." There is a process for dam reclassification, involving owner notification and contesting provisions.

a. **Abandonment**: Not defined.

b. **Engineer**: An individual who: (1) is a licensed engineer registered with the State of Georgia; (2) is competent and has relevant experience in areas related to dam
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investigation, inspection, design, and construction for the type of dam being designed, inspected, investigated, or constructed; (3) understands adverse dam incidents, failures, and the potential causes and consequences of dam failures; (4) will have responsible charge for the design of a new Category I dam or repair of an existing Category I dam; and, (5) has substantiated their qualifications to the Georgia Safe Dams Program prior to their engagement by an Owner/Operator of an existing or proposed Category I dam.

c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** Not defined.
f. **Person:** Any municipal corporation or county, or legal consolidation thereof; individual; partnership; corporation; or public or private authority and shall include the State of Georgia and all its departments, boards, bureaus, commissions, authorities, and any other agencies or instrumentalities.
g. **Repairs:** Not defined.
h. **Spillway:** The feature of a storage or detention dam which is designed to release surplus water which cannot be contained in the allotted storage space, and at diversion dams is a means to bypass flows exceeding those which are turned into the diversion system.

**Program Funding**
The laws and rules do not specifically address program funding.

**Fees and Costs**
Filing fees or bonds are not required as part of either the permit application or approval process. C.G.A. § 12-5-376.

Director dissatisfaction after inspection may result in dam maintenance, alteration, repair, reconstruction, change in construction or location, or removal at the owners expense. The costs of Division emergency measures may be recovered by the State from the owners. C.G.A. § 12-5-378.

**Permit/Approval Process**
C.G.A. § 12-5-376 provides that persons wishing to construct or operate a Category I dam must obtain a permit from the division. Observed dam distress will result in a conditional permit or denial of permit until necessary repairs are made and dam is approved. The visual inspections shall be made by the division or under provisions of a contract between the division and U.S. army Corps of Engineers, the United States Soil Conservation Service, Georgia Department of Transportation, or some other government agency.

The director may require the submission of plans and specifications and other information, as he deems relevant to the application. Disapproved permit applications shall be returned to owner with a statement of the reasons for such disapproval. Permit applications must be accompanied by a certificate from a registered professional engineer certifying that the design is in accordance with state laws and regulations. The director may also establish permit conditions necessary to assure compliance with these rules. C.G.A. § 12-5-376.

Reclassification of dam category requires dam owner notice, and initiates the permit process for operation of a dam. C.G.A. § 12-5-376.

Owners applying for permits for dams built before promulgation of these rules must obtain approval by the director only after one of the following is met: (1) submission of a detailed engineering study, prepared by a professional engineer; (2) submission of a written report prepared by the Division or other authorized agency after a visual inspection has been conducted.
by such agency; (3) submission of a written report prepared by a professional engineer registered in the State after a visual inspection has been performed. C.G.A. § 12-5-376(g).

Rules 391-3-8-.05 through 391-3-8-.09 describe the procedures for the application for permits to construct or operate existing dams, conditions for the revocation, suspension or modification of permits, permits for dam removal, and design standards for existing dams. Rules 391-3-8-.10 and 391-3-8-.11 describe procedures for permit application for the construction and operation of new dams, and design standards for new dams.

Transfer of dam ownership or proposed changes to dam operation require division notification in writing. Permits may not be transferred from one dam to another. Rule 391-3-8-.05.

C.G.A. § 12-5-377 states that it is unlawful for a dam owner or operator to remove the dam without director approval. Nothing in this part shall be construed to prevent the owner or operator of any impoundment from draining such impoundment without authorization from the director.

**Inspection Process**

[State] The director shall determine compliance with the provisions of state law based upon a visual inspection of the dam as authorized in C.G.A. § 12-5-378 (authorizing directors and division employees to enter onto dam property at reasonable times without notice). No inspection schedules or fees for State inspections are provided for in the laws or regulations. A State Dam Inventory is required once every five years after the completion of the first inventory. C.G.A. § 12-5-375.

[Owner] Visual inspection evaluations are required as part of the process of obtaining a permit for the operation of dams. The information which must be included in such an evaluation is detailed in Rule 391-3-8-.08, and includes a physical description of the structure, its emergency spillway and instrumentation, maps, hydrological data, records of performance, stability and stress analysis, seepage and settlement analysis, and other items. If inspections reveal that the dam is under abnormal stress or it was not constructed in accordance to the requirements of this Act, a detailed engineering survey shall be performed prior to final action on the permit application process.

Rule 391-3-8-.10 states that dam owners and operators shall be responsible for conducting routine inspection and maintenance of dams necessary to: prevent growth of trees or brush on embankment, prevent accumulation of debris, insure all gates and other appurtenances are in good repair and functional, maintain adequate and suitable vegetation to prevent embankment and earthen spillway erosion, determine any seepage on downstream slopes. Dam owners shall immediately notify the division when symptoms of failure, including, but not limited to erosion, surface cracks, seepage, settlement, or movement occur. The frequency of such owner inspections is not specified.

**Right of Entry**

Division employees or any authorized representatives are authorized to enter at reasonable times unto any property, public or private, to inventory, classify, and investigate any dam and to require written reports from the dam owner. If the dam owner is a resident in the same county in which the dam is located, the director shall notify the owner before entering the property. C.G.A. § 12-5-375.

It is unlawful for any person to refuse entry or access to any authorized division representative who presents appropriate credentials, or to obstruct, interfere, or hamper with division investigations. C.G.A. § Code 12-5-379.

**Operation and Maintenance**

Rule 391-3-8-.08(2), requires permits for the operation of existing dams. Permits will be issued after satisfactory application process. Permit applications shall include: detailed description of the dam; year of construction, and/or modifications or repairs; construction history; summary of
past major flood events; records of performance observations including instrumentation records; an inspection history; any other pertinent information required by the Director. Rule 391-3-8-.10. Owners and operators of dams shall be responsible for conducting routine inspection and maintenance of dams necessary to: prevent growth of trees or brush, and debris accumulation on the spillway system; insure that all gates, dissipaters, and other appurtenant works are in good repair and working order, and the spillway and outlet gates are test operated once a year; maintain adequate vegetation to prevent erosion of embankment dams; determine that any downstream seepage does not present a situation indicative of potential dam failure (if it does, the director must be notified); notify the director when any symptoms of dam failure occur, including but not limited to, erosion, surface cracks, seepage, settlement, or movement.

Emergencies/Emergency Action Plans
Based on visual inspection of the dam by the director, if determination of hazard to life is found, and there is not sufficient time to issue an administrative order, the director may immediately take such measures as may be necessary to provide emergency protection. The costs of such emergency measures may be recovered by the State from the owners. C.G.A. § 12-5-378(b). Emergency Action Plans are not required under Georgia law or regulations.

Owner Non-Compliance/Violations/Penalties
If after visual inspection, the director finds that the dam is not in compliance with the dam safety law or any rule or regulation promulgated thereunder, he may issue an administrative order to the dam owners requiring maintenance, alterations, repairs, reconstruction, change in construction or location, the draining or lowering of the water level, or removal of the dam. C.G.A. § 12-5-378. The director is also authorized under C.G.A. § 12-5-376 to revoke, modify, or suspend permits if dams are found to be in violation of permit conditions, the dam safety law, or rules. Violations include permit conditions, permits obtained via misrepresentation, failure to comply, or changes in conditions requiring revocation, suspension, or modification of permit to ensure compliance with these rules. Criminal (misdemeanor) and civil penalties for violations are available as listed in C.G.A. § 12-5-385. Hearings before a hearing officer appointed by the Board of Natural Resources shall be caused when the director has reason to believe willful or negligent violations of a division final order. Each day constitutes a separate criminal or civil offense; initial civil penalty not to exceed $1,000.00, and additional civil penalties not to exceed $500.00 per day. C.G.A. § 12-5-385. C.G.A. § 12-5-381 expressly authorizes the director to apply to a county superior court for an order enjoining any act or practice constituting an unlawful action, when in his judgment any person has or is about to engage in such unlawful action.

[Jurisdiction] The division may file in the superior court of the county in which the violation occurred, or the person under order resides, or principle place of business if the person is incorporated, a certified copy of the final order of the director or administrative law judge. The judgment shall have the same effect as though the judgment had been rendered in an action duly heard and determined by the court. C.G.A. § 12-5-380.1. If the director determines any person has engaged or is about to engage in any act or practice constituting an unlawful action, he may make an application for a permanent or temporary injunction, restraining order, or other order as may be granted by the superior court in the same county. C.G.A. § 12-5-381.

Recordkeeping
C.G.A. § 12-5-375 states that the director is responsible for annually submitting information of each dam (by category) to each county clerk, along with dam location, owner name, and owner address. The clerk shall keep these records in an easily accessible location.
Oversight
Any persons who are aggrieved or adversely affected by an order of the director shall be entitled to administrative and judicial review conducted in accordance with C.G.A. §§ 12-2-2 and 12-5-380.

Miscellaneous
The commissioner of transportation is authorized to enter into contracts on behalf of the Department of Transportation with the Division for the purpose of carrying out this part. C.G.A. § 12-5-382.
Dams and proposed structures shall be carried out in accordance with the Georgia Dams Program Quality Assurance Plan.

a. Complaints to Unsafe Conditions
- The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
- The laws and rules do not specifically address environmental impact.

c. Severability
- The laws and rules do not specifically address severability.

d. Supplemental Reference Materials
- Rule 391-3-8-.09. Design manuals, evaluation guidelines, and procedures used by the following agencies can be considered as acceptable design or evaluation references, except as those references differ from Georgia law and these regulations:
  (a) U.S. Army Corps of Engineers (with specified considerations)
  (b) Natural Resources Conservation Service (with specified considerations)
  (c) U.S. Department of the Interior, Bureau of Reclamation
  (d) Federal Energy Regulation Commission
  (e) Other design and evaluation methods may be used to demonstrate compliance with these rules, but are subject to Director approval.
IDAHO

Summary
[Pros] State police powers are granted to the director to administer the State Dam Safety Program. The department is expressly authorized to enter into any agreements with other state agencies having jurisdiction over water storage structures. Fees must be submitted along with applications for dam construction or modification, based on reservoir storage capacity, increase in structure size, and department costs for inspections during proposed works. Ideally, fee estimates will account for all department inspection, application processing, and filing costs. A fund is established to manage these rotating moneys. Owners must provide financial surety to cover costs of abandoning their dam or reservoir. Immediately after approved works are complete, owners must submit to the department a notice of completion. Actions triggering State exemption from liability are identified. Approved permits may include conditions as necessary upon the discretion of the director, and may be revoked upon owner non-compliance with permit conditions or State laws. Dams and reservoirs are classified according to size, storage capacity, and risks to life and property. Plans in applications must be submitted per department format and media requirements. All construction materials may be inspected and must be approved by the department. Dam and reservoir sites must be cleared of all trees, brush, large rocks, and all other debris, including those large enough to clog the spillway, unless otherwise waived by the director. The Idaho Administrative Code establishes extensive minimum criteria to evaluate earthen dam design and construction. “Small Dams” otherwise exempted from regulation, but located in high risk areas ad determined by the department, must submit fees, plans, and specifications for department approval. An “abandonment plan” which provides a stable, maintenance-free condition any time the dam is not in use (applicable generally to mining operations), must be submitted to the department, unless waived by the director.
[Cons] Emergency action plans are not required. The inspection frequency is once every five (5) years after initial construction inspection, or at State discretion. Owner inspection schedules are not established. The statutes do not specify fines for violations.

Citation and Title
[Administrative Agency] Department of Water Resources, Director

Jurisdiction/Powers of Department
The entity with jurisdiction to supervise the construction, enlargement, alteration, repair, maintenance, operation, and removal of dams is the Idaho Department of Water Resources (“department”) and the Director of the Department of Water Resources (“director”). I.C. § 42-1710; Rule 1.1.2. The law gives authority to the Idaho Water Resources Board to adopt rules and regulations (I.C. § 42-1714) and enter into agreements with other state agencies having jurisdiction over water storage structures (I.C. § 42-1710). Under no circumstances do these rules deprive the department or director of any exercise of duties, powers, and jurisdiction conferred by law. Rule 1.2.b. Department orders are final, conclusive, and binding upon all State agencies, regulatory or otherwise, as to dam safety. I.C. § 42-1717.
“Small Dams” otherwise exempted from regulation, but located in high risk areas ad determined by the department, must submit fees, plans, and specifications for department approval. Rule 6.
Liability and Immunity
No action shall be brought against the State, the Water Resources Board, the Director, or the Department of Water Resources or their respective agents or employees for the recovery of damages caused by the partial or total failure of any dam, including: permit approval; issuance of enforcement orders; control and regulation; emergency measures; and, use of department design recommendations. I.C. § 42-1717.
Nothing in the law shall be construed to relieve an owner or operator of a dam of the legal duties, obligations or liabilities incident to the ownership or operation of the dam. I.C. § 42-1717.
Owners must provide the department a bond or other acceptable surety adequate to complete the abandonment plan if the owner abandons the site without conforming to the plan. The bond/surety amount shall be determined by the director and shall not duplicate other governmental agency sureties. Owners may deposit cash and governmental sureties instead of bonds, provided they are of equal amount. I.C. § 42-1714.

Definitions/Dam Classifications
_Dam_ means any artificial barrier, together with appurtenant works, which is or will be 10 feet or more in height or has or will have an impounding capacity at maximum storage elevation of 50 acre-feet or more. _Height of a dam_ is defined as the vertical distance from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the director, or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation. I.C. § 42-1711.
_Certain (small) projects are not included as regulated dams. I.C. § 42-1711._
  • Barriers constructed in low-risk areas which are six feet or less in height regardless of storage capacity
  • Barriers constructed in low-risk areas which could impound ten acre feet or less at maximum storage elevation regardless of height
_Mine tailings impoundment structures_ are any artificial embankment which is or will be more than 30 feet in height measured from the lowest elevation of the downstream toe to the maximum crest elevation, constructed for the purpose of storing mine tailings slurry. I.C. 42-1711. Safety of Dams Statutes amended in 1978 to include regulation of mine tailings structures.
_Dam size classifications_ are as follows:
  • _Small dams_ are twenty feet or less in height and are capable of storing less than 100 acre-feet of water.
  • _Intermediate dams_ are more than twenty feet, but less than 40 feet in height, or are capable of storing 100 acre-feet or more, but less than 4,000 acre-feet of water.
  • _Large dams_ are 40 feet or more in height or are capable of storing 4,000 acre-feet or more of water.

_Risk Categories_ are described in a table that describes losses and damages in downstream areas which could be attributable to dam failure. In general they are as follows:
  • _Low risk dams_: No permanent structures for human habitants are nearby; failure would cause only minor damages.
  • _Significant risk dams_: Failure would affect one or more structures for human habitation and would cause significant damage to land and property.
  • _High-risk dams_: Failure would cause major damage to surrounding urban developments and pose potential threat to life.

_a. Abandonment:_ Not defined.
b. _Engineer:_ All works shall be under the responsible charge of a registered professional engineer.
The engineer is not relieved of any responsibility to assure that construction is accomplished in accordance with approved plans. Rules 4, 12.
c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** Includes any one of the following who own, control, operate, maintain, manage, or propose to construct a dam, reservoir or mine tailings impoundment structure: the State and its departments, agencies, institutions, and political subdivisions; the United States and any of its departments, bureaus, agencies and institutions (provided that the United States is not required to pay any fees, and shall submit plans, drawings, and specifications for information purposes only); every municipal or quasi-municipal corporation; every public utility; every person, firm, association, organization, partnership, business trust, corporation, or company; the duly authorized agents, lessees, or trustees of any of the foregoing; or receivers or trustees appointed by the court for any of the foregoing.
f. **Person:** Not defined.
g. **Repairs (Alterations):** Only such alterations or repairs as may directly affect the safety of the dam, reservoir, or mine tailings impoundment structure, as determined by the department.
h. **Spillway:** Not defined.

**Program Funding**
Fees submitted during application are estimated to anticipate department costs for department inspections during construction. All moneys received by the department under this chapter shall be deposited into the “water administration fund” and shall be available to the department in carrying out the dam safety laws. I.C. § 42-1713.

If costs for remedial actions taken by department to protect life and property exceed the moneys appropriated from the general fund for that purpose, deficiency warrants may be issued to defray costs. To recover costs and expenses for any remedial works done in emergency – which must be paid within sixty (60) days of invoice – action may be brought by the director in that district. I.C. § 42-1718.

**Fees and Costs**
Application fees are established by a schedule based on storage, or increases in storage capacity of the reservoir, and must be submitted with the application. Fees for alterations or repairs of existing dams shall be based on an estimate, made by the director, of costs of inspections to be made, however, in no case shall such fees exceed that which would be required by the fee schedule for dam construction. Submitted fees are not refundable. I.C. § 42-1713.

Fee schedule is as follows: (a) for 1,000 acre-feet capacity or less: $10 for each 10 acre-feet; (b) for 1,000 to 10,000 acre-feet capacity: $1,000 plus $1 for each 10 acre-feet; (c) for greater than 10,000 acre-feet storage capacity: $1,900 plus $0.20 for each 10 acre-feet. In no case shall fees exceed $6,000. I.C. § 42-1713.

An application and fee are required for small dams, 20 feet or less in height, or store less than 100 ac-ft., but do not require submittal of an engineering design.
The Statutes do not provide for an inspection fee.
The cost of any remedial measures shall be recoverable from the owner. I.C. § 42-1718.

**Permit/Approval Process**
The department oversees the construction, enlargement, alteration, repair, operation and maintenance, or removal of dams. Owners of dams that are more than 20 feet in height (or store more than 100 ac-ft.) shall file an application and fee with plans and specifications prepared by a professional engineering consultant that conform to the Department's safety standards which are included in the Rules. I.C. § 42-1712. Applications will not be considered until the filing fees
are received. I.C. § 42-1713. Plans must initially be submitted in the form of non-reproducible prints. Rule 4.3.

Following a thorough technical review, plans, drawings, and specifications are approved (in no less than 14 days, or no more than 60 days) - except for plans for construction, alteration or repair of federal projects, which do not require a fee but require the filing of technical information only. Applicants must commence approved works within one year of department approval, or permit is void, upon notice to applicant. The department may request any investigation results or tests before application approval. I.C. § 42-1712. Denied applications shall be returned with recommendation for modification and may be revised and resubmitted to the department within 30 days, or as allowed by the department. A project facility approved for construction, enlargement, alteration or removal shall proceed under the responsible charge of a registered professional engineer, who shall certify same was accomplished in accordance with the approved design (or as an approved revisions) before the director authorizes storage. I.C. § 42-1712-1716.

The Idaho Administrative Code establishes extensive minimum criteria to evaluate earthen dam design and construction, including embankment stability and slope, width of the dam top, impervious core material specifications, cutoff trenches or walls, drainage, freeboard, riprap (to prevent erosion), outlet controls, water release capability, and other analyses. Rule 5.

A “Certificate of Approval” shall be issued by the department upon finding the structure is safe to impound water. Such certificates may be modified or revoked, after hearing in which any interested parties may attend. I.C. § 42-1719.

Spillway design criteria are required and are listed in the rules. Rule 8,1,11.

Owners of structures for which construction had commenced before or during passage of these laws must submit plans and specifications for department approval according to similar process governing general applications. I.C. § 42-1721.

Construction and approved works must be pursued with reasonable diligence to completion. I.C. § 42-1721.

An “abandonment plan” which provides a stable, maintenance-free condition any time the dam is not in use (applicable generally to mining operations), must be submitted to the department, unless waived by the director. Rule 65, 2.

**Inspection Process**

**[State]**

All dams (including federal dams) twenty feet or more in height or mine tailings structures more than 30 feet in height must be inspected at least once every two years. Supervision over the maintenance and operation of dams, reservoirs, and mine tailings structures is vested in the director. The director shall, at State expense, cause inspections as often as advisable and after such inspections, if serious deficiencies are found, will provide written notice and/or order to the owner for corrective action. Inspections shall be done at department discretion, but at least once every five (5) years. I.C. § 42-1717. During construction, however, the department must inspect ongoing works during the following stages of construction: (1) after clearing of foundation area; (2) after installation of the outlet conduit; and, (3) after construction is completed and before water impoundment. Rule 4,8,a,b,c. All construction materials may be inspected and must be approved by the department. Rule 4,9. The Statutes do not provide for an inspection fee. The Statutes provide for inspections by the department during the course of construction and suspension of work if construction does not conform. I.C. § 42-1715.

**[Owner]**

Owner inspection schedules are not stated in the laws. However, the owner is required to keep data and provide information to the director on operation and maintenance, staffing and engineering and geologic investigations and from time to time shall have inspections done at state expense. Owners must, at their expense, perform such work as necessary to disclose information sufficient to enable the director to determine conditions of a dam. I.C. § 42-1717.
construction, it is the responsibility of the engineer to submit test reports (e.g. soil material analyses, density tests, concrete strength tests). Rules 5, 13. Information needed by the director sometimes requires work by professional engineers, but law does not require this. Immediately after approved works are complete, owners must submit to the department a notice of completion, and soon after submit descriptive materials and drawings showing the competed works. I.C. § 42-1716.

Right of Entry
Upon imminent threat to life or property, the department may employ any means necessary to mitigate the risks thereto.

Operation and Maintenance
The owner must keep operation and maintenance records upon department request. I.C. § 42-1717. Dam and reservoir sites must be cleared of all trees, brush, large rocks, and all other debris, including those large enough to clog the spillway, unless otherwise waived by the director. Rules 5, 12, 13. Other requirements include maintenance of gates, seals, valves, pipes, and lift mechanisms. Rule 55, 2.

Emergencies/Emergency Action Plans
Owners must notify the department of any sudden or unprecedented flooding or unusual or alarming circumstances affecting the safety of the dam or reservoir. I.C. § 42-1717. The director shall immediately employ any remedial means necessary to protect life and property if the condition of any dam is so dangerous as not to permit time for the issuance and enforcement of an order. The director shall continue in full charge and control of such dam until it is rendered safe or the emergency occasioning the action is ceased. The cost of any remedial measures shall be recoverable from the owner. I.C. § 42-1718.

Owner Non-Compliance/Violations/Penalties
If at any time during construction, enlargement, repair or alterations of any dam the director finds that the work is not being done in accordance with provisions of the approval and approved plans and specifications, or if the dam is an unauthorized construction, he shall give a written notice (or order) and order by certified mail or by personal service to the owner. The owner is directed to cease work, draft the reservoir or take any corrective action necessary to rectify the problem, including draining the reservoir. I.C. § 42-1715, 1717. The director may give notice and hold a hearing to revoke or modify storage authorization, whenever such action is deemed necessary to safeguard life and property. I.C. § 42-1719. Violators of the laws or regulations, and those who willfully conduct works without approval, are guilty of a misdemeanor. Each day constitutes a separate offense. I.C. § 42-1720. The Statutes do not specify fines for violations. The director may issue administrative enforcement actions via written notice of violation. I.C. § 42-1720.

Recordkeeping
The director may require owners to keep track of records on operation, maintenance, staffing, engineering, geologic investigations. Such information must be made available to the department upon request or inspection. I.C. § 42-1717.

Oversight
Any party or parties feeling aggrieved by the determination of the director in refusing to approve a plan, or by issuance of an order, may seek judicial review in accordance with I.C. § 42-1701A(4). I.C. § 42-1719.
Miscellaneous

a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - No action shall be brought against the owner for pollution which may occur in the event that the director orders emergency dumping or bypassing. I.C. § 42-1718.

c. Severability
   - The laws and rules do not specifically address severability.

d. Supplemental Reference Materials
   - The laws and rules do not specifically address supplemental reference materials.
ILLINOIS

Summary
[Pros] The administrative rules under 17 Ill. Adm. Code § 3702 (Construction and Maintenance of Dams) set forth in great detail what the owner of an existing dam is required to do to meet the appropriate safety standards. Specifically, the owner of a dam that was permitted and built in compliance with an OWR permit before September 2, 1980, and that is currently in good repair shall not be required, except in compliance with §§ 3702.150 or 3702.190, to make changes in the design, structure, or construction of such dam. The owner of a dam that was permitted and built before September 2, 1980, but is not in accordance with the OWR permit or is not in good repair, shall be required to meet all current standards for existing dams. The owner of a dam built after September 2, 1980, shall be required to meet all standards for proposed dams existing at the time of its construction. Operation, maintenance, inspection and financial responsibility standards must be complied with for all dams and reservoirs.

Under 17 Ill. Adm. Code § 3702, OWR and federal agencies conduct inspections of existing dams having a potential loss of life or property damage in case of a dam failure. As inspections are completed, OWR will notify owners of any deficiencies discovered during the course of the inspection including unsafe conditions and/or serious deficiencies requiring major modifications. Following written notice from OWR, the owner must provide written assurances to OWR of the owner’s intention to rectify the deficiencies noted, the date which the owner will submit a completed permit application (if necessary), the time frame for initiating and completing the appropriate remedial measures, and the methods and designs to be used for the remedial measures.

[Cons] Neither the State statutes nor the administrative rules include any mention of a dam safety fund, permit application fees, or annual fees. The State statute concerning dam construction is very limited.

Citation and Title

[Rules/Regulations] The rules pertaining to the dam safety program are contained in the Illinois Administrative Code, Title 17: (Conservation), Chapter I: (Dept. of Natural Resources), Subchapter h: (Water Resources). These rules were originally adopted September 2, 1980, and last revised April 10, 1998.

[Administrative Agency] The Department of Natural Resources (“department”), Office of Water Resources (“OWR”)

Jurisdiction/Powers of Department
The department is authorized by law to do the following: to require that existing dams be maintained in a proper state of repair and at an appropriate height for control of flood waters, to compel the installation of fishways in dams where deemed necessary, to carry out inspections, establish standards, and issue permits for the safe construction, reconstruction, repair, operation, and maintenance of dams. The department is authorized to enforce these statutory provisions through injunction or other appropriate action. Other duties of the department include: notifying local public officials in the area if a dam is determined to be unsafe, issuing orders for changes in structure, operation, and maintenance of dams for protection of life and property if a dam constitutes a threat to such, notifying dam owners of defects found during inspections and providing a list of standards which, if complied to, would put the dam into compliance with state requirements.
Illinois law also requires that, except in emergency situations, the department may not issue orders for alteration of a dam until after notice and opportunity for public hearing have taken place.

**Liability and Immunity**
Neither the department nor its agents or employees shall be liable for damages from partial or total dam failure, operation or maintenance. Nothing in the Acts shall relieve the dam owner or operator from legal duties, obligations, or liability arising from ownership or operation of the dam. 615 I.L.C.S. 5/23a.

Adherence to the rules in Illinois Administrative Code does not guarantee the safety of a dam or relieve the owner of liability in case of dam failure. The OWR does not undertake to insure or certify the adequacy of any dam structure or appurtenance.

**Definitions/Dam Classifications**
Illinois rules define dams as "all obstructions, walls, embankments, or barriers, together with their abutments and appurtenant works, if any, constructed for the purpose of storing or diverting water or creating a pool. Not included are underground or elevated tanks to store water." 17 Ill. Adm. Code Ch. 1, § 3702.

*Dam height* is the measurement in feet from the natural bed of the stream or watercourse at the downstream dam slope toe of the barrier to the top of the embankment or barrier.

**Hazard Classification Criteria:** Dams are categorized according to the degree of threat to life and property in case of failure.

*Class I dams:* those for which failure has a high probability of causing loss of life or substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed. This is similar to that of US Army Corps of Engineers High Hazard Potential or USDA Natural Resources Conservation Service Class (c) dams.

*Class II dams:* those for which failure has a moderate probability for causing loss of life or may cause substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed. This is similar to USCOE Significant Hazard Potential or USDA/NRCS Class (b) dams.

*Class III dams:* those for which failure has a low probability for causing loss of life or substantial economic loss in excess of that which would naturally occur downstream of the dam if the dam had not failed. This is similar to the USCOE Low Hazard Potential or USDA/NRCS Class (a) dams.

Designation by OWR of dam classification – Before assigning or changing the dam classification for a new or existing dam, OWR shall give notice and opportunity for hearing pursuant to 17 Ill. Adm. Code Ch. 1, 3702.17, to the applicant or existing dam owner and other interested persons of such action.

In addition, dams in Illinois are categorized according to size in the following manner:

<table>
<thead>
<tr>
<th>Category</th>
<th>Capacity (acre-feet)</th>
<th>Height (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>less than 1000</td>
<td>less than 40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1000 to 50,000</td>
<td>40 to 100</td>
</tr>
<tr>
<td>Large</td>
<td>more than 50,000</td>
<td>more than 100</td>
</tr>
</tbody>
</table>

Illinois rules identify those dams that are under the jurisdiction of the state. All Class I and II dams are regulated. Class III dams are regulated if they meet the following criteria:

- The drainage area of the dam is 6400 acres or more in a rural area, or 640 acres in an urban area, or
• The dam is 25 feet or more in height provided that the impounding capacity is greater than 15 acre-feet, or
• The dam has an impounding capacity of 50 acre-feet or more provided that the dam height is greater than 6 feet.

  a. Abandonment: Not defined.
  b. Engineer: A structural and/or professional engineer registered in the State of Illinois, under the Professional Engineering Practice Act [225 ILCS 325] and the Structural Engineers Act [225 ILCS 340], with expertise in the investigation, design, construction, and operation of dams.
  c. Hazard Potential: Not defined.
  d. Operator: Not defined.
  e. Owner: Not defined.
  f. Person: Not defined.
  g. Repairs: Not defined.
  h. Spillway: Not defined.

Program Funding
The laws and rules do not specifically address program funding.

Fees and Costs
No filing fees established.

Permit/Approval Process
[Permit Application]
Application by the owner of a dam must be made to construct a new dam, make a major modification to existing dam, and/or remove dam contents.

The owner of a proposed Class I or II dam shall obtain OWR permit prior to the start of new or modification construction. 17 Ill. Adm. Code § 3702.30. The owner of a proposed Class III dam shall obtain an OWR permit prior to the start of construction only if: (i) the drainage area of the proposed dam is 6400 acres or more in a Rural Area of 640 acres or more in an Urban Area, or; (ii) the dam is 25 feet or more in height provided that the impounding capacity is greater than 15 acre-feet, or; (iii) the dam has an impounding capacity of 50 acre-feet or more provided that the dam height is greater than 6 feet. Application for permits to construct new dams or make major modifications to existing dams, or for permits to remove dams shall be made on forms provided by the department and shall include information described in 17 Ill. Adm. Code Ch. 1, 3702.60 and 3702.70. The preliminary and all subsequent plans and reports shall be prepared under the direction of an engineer or other qualified person. 17 Ill. Adm. Code § 3702.40.

The owner of a Class I, II, or III dam that wishes to remove his dam, shall obtain, prior to the initiation of the dam removal, an OWR permit to remove the dam. The application shall include design plans prepared by an engineer, which includes computations for design of the method and timing for dewatering the reservoir.

[Permit Approval]
Upon receipt of a complete application for permit, the department issues a public notice, allows for a comment period of at least 21 days, and if deemed necessary, may hold public hearings on the application. The department shall approve or deny any permit within 90 days (or 150 days in the case of public hearing) unless a longer time period is agreed to in writing with the applicant. If the department has not approved or denied the permit within the time period, the application is deemed approved. The department may give emergency approval upon expiration of the comment period if necessary. If the department determines that a dam is in need of major modification or breaching, the Secretary may issue an order (after the department has provided an
opportunity for hearing) that the owner take appropriate corrective action. If the owner fails to comply, the Secretary may seek appropriate judicial action.

The following additional rules apply to the approval of dam permits: Permits are not transferable, a new dam owner must apply for a permit in his or her own name. The department may accept permits issued by another state or federal agency if the requirements are essentially the same. The department may enter into agreements with federal or state agencies regarding the use of joint applications for permits. Permits issued by the department are subject to Standard Permit Conditions as outlined in 17 Ill. Adm. Code Ch. 1, 3702.200, and to any special conditions as may be imposed by the department to assure compliance with Illinois law and rules.

The Illinois Administrative Code describes the scope of the permit process in greater detail. Design criteria necessary when submitting an application for permit are laid out in the rules, 17 Ill. Adm. Code Ch. 1, 3702.40, and generally follow the U.S. Corps of Engineers' guidelines. The rules state that if the dam owner cannot adequately demonstrate financial soundness before his permit is approved, the department may require the applicant to post a performance bond. The amount of the bond will be that estimated by the department as reasonably necessary to safely breach the dam if the dam becomes a threat to life and/or property.

**Inspection Process**

[State] Illinois rules give the State the right to access onto private lands in order to inspect a dam before, during and after construction and during the life of the dam. Except under emergencies, the State will notify the owner at least 10 days in advance of the inspection. The frequency of the State’s inspection is not specified in the Illinois laws or Codes. [Owner] The department publication, *Guidelines and Forms for Inspection of Illinois Dams (IL DWR November, 1999)*, is used to assist dam owners in meeting the requirements for maintenance and inspection of dams listed in Section 3702.40. The rules require that owners submit a maintenance plan detailing the procedures and schedules for maintaining the dam in good repair. The maintenance plan must include inspection reports, prepared by an engineer or other qualified personnel. Inspection reports must be submitted on forms furnished by the department, according to the following schedule: Owners of Class I dams, annually; Owners of Class II dams, every three years; Owners of Class III dams, every five years. Additionally, owners of Class II and III dams are required to submit annual statements indicating adherence to the maintenance plan, and describing any changes in land use within the floodplain. If required by the approved maintenance plan, the owners of Class I and II dams may be required to provide additional inspections and reports following unusual storm or seismic events.

**Right of Entry**

The department and personnel thereof shall have the right of access to supervise the execution and details of the work authorized under the permit. 17 Ill. Adm. Code § 3702.200.

**Operation and Maintenance**

An applicant for a Class I or II dam shall submit an operational plan specifying the method and schedule for the operation of the dam and the routine operating procedures to keep the dam in good working order. Dam owners must submit a maintenance plan at the time of application, detailing the procedures and schedules to be followed to maintain the dam.

**Emergencies/Emergency Action Plans**

In emergency situations, the department is to follow procedures as outlined in 17 Ill. Adm. Code Ch. 1, 3702.190: 1) if a dam constitutes serious threat to life or of substantial property damage, or is found to be in immediate danger of failure, the department shall notify the owner to take necessary corrective action; 2) the department may hold public meetings to inform concerned persons and officials of the nature of the hazard; and 3) if the dam owner fails to take action, or if
imminent hazard makes notice and opportunity for hearing infeasible, the department may take appropriate administrative or judicial emergency action. The owner, at the time of application, shall submit an emergency warning plan. The plan must outline the procedures to be followed during major storm events or other emergency situations. Under this plan, a person designated by the dam owner would monitor dam conditions, and would warn appropriate State and local officials if major problems require immediate repairs and would indicate how the owner plans to accomplish the needed repairs, and indicate if evacuation of downstream areas became necessary. 17 Ill. Adm. Code § 3702.40.

**Owner Non-Compliance/Violations/Penalties**
The department will review all instances of alleged non-compliance and provide the owner reasonable opportunity to submit information concerning the issue of non-compliance. If the department finds non-compliance, it may issue a notice of non-compliance indicating the nature of deficiencies and potential hazards. The Secretary may hold a hearing, and if non-compliance is found, may seek judicial enforcement. The department will send notices of significant non-compliance to appropriate local officials, downstream property owners and residents who might be threatened by the dam's deficiencies. The department, along with the Illinois Emergency Management Agency, will provide assistance to local officials and property owners in instituting emergency procedures for areas threatened by the failure of a non-complying dam. Penalties and violations are included in 615 I.L.C.S. 5/26a. They are not exclusive to the dam safety program.

**Recordkeeping**
Recordkeeping is addressed in various section of the laws and rules.

**Oversight**
[Hearing Procedures]
Procedures for permit, enforcement, classification, spillway design variation and non-compliance hearings are set out in 17 Ill. Adm. Code Ch. 1, 3702.170. These procedures apply in addition to those established for contested cases under the Illinois Administrative Procedure Act. Aspects of the hearing process covered by the procedures include: notification of affected parties, subpoenas, recording of testimony and evidence, findings, rationale and notification of the decision, requirements for a decision or order for breaching or modification, and burden of proof.

**Miscellaneous**
- **Complaints to Unsafe Conditions**
  - The laws and rules do not specifically address complaints to unsafe conditions.
- **Environmental Impact**
  - The laws and rules do not specifically address environmental impact.
- **Severability**
  - The laws and rules do not specifically address severability.
- **Supplemental Reference Material**
  - For detailed information on the application for permits, the department provides the publication, *Procedural Guidelines for Preparation of Technical Data to be Included in Applications for Permits for Construction and Maintenance of Dams (IL DWR, January 1990)*. These guidelines are provided to aid in the use of generally accepted methods of testing, analysis and computation, and include information on preliminary and final design reports, hydrologic and hydraulic investigations, structural and geotechnical investigations and design, and operation and maintenance plans.
INDIANA

Summary
[Pros] Under the statute, the owner of a high hazard structure must have a professional engineer make an engineering inspection of the high hazard structure at least once every two years. Upon completion of the inspection, the owner must submit to the department a report of the inspection in a form approved by the department. The owner is required to maintain and keep the structure in the state of repair and operating condition required by the exercise of prudence, due regard for life or property, and the application of sound and accepted engineering principles. The rules grant the department the authority to take control of a structure during an emergency, if the conditions of a structure become so dangerous to the safety of life and property and there is not sufficient time for the issuance and enforcement of an order for the maintenance, alteration, repair, reconstruction, change in construction or location, or removal of the structure. The department may recover the cost of the emergency measures from the owner through appropriate legal action.

[Cons] Although provided the authority to promulgate rules, the Indiana Natural Resources Commission, through the Division of Water has not done so. Inspection of existing dams is primarily the responsibility of the department. Under the provisions of I.C. § 14-27-7-4, the department is required to make engineering inspections of all dams at least once every three years. In addition, although the statute requires that a permit be obtained prior to the construction, repair, or alteration of a dam, the actual permit process is not discussed. The statute does not contain a “definitions section.” Within the body of the statute, minimal definitions are provided. The statute does not state where funding for the dam safety program originates or whether State funds are even appropriated to the program. Emergency action plans are not required.

Citation and Title
[Rules/Regulations] Although authorized by law, no separate body of administrative rules or regulations has been promulgated pertaining to the state dam safety program.
[Administrative Agency] Indiana Natural Resources Commission

Jurisdiction/Powers of Department
The Indiana Natural Resources Commission (“commission”), through the Division of Water, is granted the jurisdiction and supervision over the state of the maintenance and repair of dams. I.C. § 14-27-7-3 authorizes the commission to make, adopt, and disseminate rules to maintain the safety of life and property. Provisions I.C. § 14-27-7-4 through § 14-27-7-7 list the powers of the commission regarding inspection of dams and ordering remedial measures, taking emergency action, and the right of entry on property to make inspections. The commission has the authority to establish design standards, and may enforce such standards through appropriate application of its powers, including ordering the owner to repair deficient structures at the owner's expense. General powers and duties of the commission with regard to flood control are listed in I.C. § 14-28-1-13.

Liability and Immunity
According to the provisions of I.C. § 14-27-7-9, the commission, its officers, agents and employees are not liable for damages arising from maintenance, operation, or failure of any dam, dike or levee, or by the issuance and enforcement of any order or rule issued by the commission.
Definitions/Dam Classifications
According to the provisions of I.C. § 14-27-7-4, structures subject to state inspection requirements (jurisdictional structures), include all dams, levees, dikes, and floodwalls and appurtenant works which meet or exceed the following criteria:
a) The drainage area above the dam site is more than one square mile;
b) The height of the dam above the natural stream bed or the lowest point on the valley floor is more than 20 feet;
c) The volume of water impounded by the dam to the emergency spillway level is more than 100 acre-feet; or
d) The rights of other property owners are affected.

Dam height – is defined as the vertical dimension of a structure as measured from the lowest point in the natural streambed or watercourse under the centerline of the structure to the top of the structure. I.C. § 14-27-7.5-3.

Hazard Classification – Under I.C. § 14-27-7.5-2, hazard classification means a rating assigned to a structure by the department based on the potential consequences resulting from the uncontrolled release of its contents due to a failure or mis-operation of the structure.
High Hazard: A structure the failure of which may cause the loss of life and serious damage to homes, industrial and commercial buildings, public utilities, major highways, or railroads.
Significant Hazard: A structure the failure of which may damage isolated homes and highways, or cause the temporary interruption of public utility services.
Low Hazard: A structure the failure of which may damage farm buildings, agricultural land, or local roads.

a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: An individual, a firm, a partnership, a co-partnership, a lessee, an association, a corporation, an executor, an administrator, a trustee, the state, an agency of the state, a municipal corporation, a political subdivision of the state, a legal entity, a drainage district, a levee district, a conservancy district, and any other district established by law, or any other person who has a right, title, or an interest in or to the property upon which the levee, dike, or floodwall and appurtenant works is located.
f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: Not defined.

Program Funding
The law does not specifically address program funding.

Fees and Costs
The department shall charge a fee of $200 for the engineering inspection of a significant hazard dam and a fee of $100 for inspection of a low hazard dam. I.C. § 14-27-7.5-10. The department assesses a $50 fee for permit applications.

Permit/Approval Process
I.C. § 14-28-1-22 requires a permit from the commission to be obtained prior to the construction, repair, or alteration of a flood control structure. Owners must submit a verified, written
application, along with plans and specifications for the structure, and a non-refundable $50 fee. No renewal is necessary provided the authorized activity is begun within two years of the approval. Minimum design requirements are not referenced in the Indiana dam safety law, but recommended guidelines are contained in the Department of Natural Resources publication, "Building a Pond".

**Inspection Process**

[State] The commission is required under the provisions of I.C. § 14-27-7-4 to make engineering inspections of all dams at least once every three years, (or more frequently depending on the circumstances of the case), and upon the written request of any affected person or agency. Under I.C. § 14-27-7.5-10, the department shall make an engineering inspection of a significant hazard structure at least one time every three years and a low hazard structure at least one time every five years. The department shall place in the files of the department a report of each inspection conducted. Under I.C. § 14-27-7-5, if the department finds that a dike, floodwall, levee or appurtenance is not sufficiently strong, not maintained in a good and sufficient state of repair or operating condition; or unsafe and dangerous to life or property, the department shall issue a notice of violation to the owner. If the department finds deficiencies in the construction, maintenance or repair of a dam, an order shall be issued directing the owner to make at his expense any repair deemed necessary within the time limit specified in the order. Inspection fees are assessed by the State. For a significant hazard structure, a fee of $200 is assessed. For a low hazard structure, a fee of $100 is assessed.

[Owner] The owner of a high hazard structure is required to have a professional engineer make an engineering inspection of the high hazard structure at least one time every two years. The engineer must submit a report of the inspection in a form approved by the department. The report shall include an evaluation of the structure’s condition both structurally and operationally as well as a determination of whether deficiencies exist. If deficiencies exist, the report shall include recommended maintenance, repairs and alteration. I.C. § 14-27-7.5-9. The owner shall perform the necessary maintenance, repairs, or alterations.

**Right of Entry**

The department and the department’s agents, engineers and other employees may enter upon any land or water in Indiana without liability for trespass. The owner shall cooperate with the department, facilitate access, and furnish upon request the plans, specifications, operating and maintenance data. I.C. § 14-27-7-8, I.C. § 14-27-7.5-14.

**Operation and Maintenance**

Under I.C. § 14-27-7.5-7, the owner shall maintain and keep the structures in the state of repair and operating condition required by the exercise of prudence, due regard for life or property, and the application of sound and accepted engineering principles.

**Emergencies/Emergency Action Plans**

Emergency measures are addressed in I.C. § 14-27-7-6. The commission is authorized to take such measures as may be essential to provide emergency protection of life and property, including lowering the water level by releasing from the reservoir. The costs of such emergency measures may be recovered from the dam owner by appropriate legal action. Emergency Action Plans are not referenced in the law.

**Owner Non-Compliance/Violations/Penalties**

I.C. § 14-27-7-6 states that an owner who fails to effect the maintenance, alteration, repair, reconstruction or removal of a dam within the time limit set by a commission commits a Class B infraction, and every day of failure constitutes a separate offense. The commission is authorized
under I.C. § 14-28-1-35 to maintain an action to enjoin any violation of the Flood Control chapter.

**Recordkeeping**
The commission shall keep on file a copy of its report following each inspection conducted under I.C. § 14-27-7.5-10.

**Oversight**
The appeal process is addressed in the Administrative Adjudication Act and its associated rules.

**Miscellaneous**
Indiana does not have a body of administrative regulations pertaining to dam safety, but the commission provides designers, owners, operators with important information and State guidelines.

  a. **Complaints to Unsafe Conditions** - A property owner, the owner’s representative, or an individual who resides downstream from a structure: (1) over which the department does not have jurisdiction; and (2) that the property owner, the owner’s representative, or the individual believes would cause a loss of life or damage to the person’s home, industrial or commercial building, public utility, major highway, or railroad if the structure fails; may request in writing that the department declare the structure a high hazard structure. I.C. § 14-27-7.5-16.

  b. **Environmental Impact**
  - The laws do not specifically address environmental impact.

  c. **Severability**
  - The laws do not specifically address severability.

  d. **Supplemental Reference Material**
  - Department of Natural Resources publication “Building a Pond”.
IOWA

Summary
[Pros] The Iowa statute emphasizes the importance of identifying existing and anticipated floodplains to develop a floodplain-mapping plan. The rules specifically discuss abandonment and removal of existing dams. Specifically, the rules state that the abandonment of a dam, or the intent to permanently cease or cause to cease all acts of construction, operation, and maintenance of a dam, is prohibited. Agency approval is required to remove any dam that exceeds the thresholds set forth in the rules.

[Cons] The rules primarily focus on water allocation and use, floodplain control and floodway mapping, rather than dam safety. It is unclear from these rules whether the State or the owner bears the greater burden of inspecting existing dams. In any event, under the rules, the owner of a major structure is responsible for annual maintenance inspections and submission of a written inspection report. The rules, however, do not define “major structure.” The department is responsible for inspecting existing dams to evaluate the construction, operation, and maintenance of dams, to identify deficiencies in dams, and to identify other structures or uses which may affect the hazard class or use of a dam. The department is required to complete said inspections on a regular basis: once every two years for high hazard structures and once every five years for other major structures. In addition, under these rules, no fees are assessed to permit applications or agency inspections. Also, although a definitions section is included under I.C. § 455B.261, the section provides no definitions relevant to the Dam Safety Program. Emergency action plans are not required.

Citation and Title

[Rules/Regulations] Regulations are in Chapters 70-75 of the Iowa Administrative Code (I.A.C.), Title V, Flood Plain Development. The regulations were enacted in 1975, and last amended in 1994.

[Administrative Agency] Department of Natural Resources

Jurisdiction/Powers of Department
The Iowa Department of Natural Resources (“department”) is responsible for the water resource programs in the State and has jurisdiction over all flood plains and floodways. I.C. § 455B.262-263 includes the declaration of policy and the duties of the department in this regard, including the mapping out the type and extent of existing and anticipated flood plain development, and the need to delineate floodplain boundaries. Along with these broad powers, the department is authorized under I.C. § 455B.264 to grant or deny permits upon application for the construction or maintenance of dams.

Other responsibilities of the department are listed in I.C. §§ 455B.271 and 275. These include: the issuance of emergency orders to suspend or restrict water usage; modification or cancellation of a permit for violation of the terms of the permit or the law, or to protect the public health or safety; removal of a structure which affects the efficiency or capacity of the floodway; requirement of a performance bond as a condition of an approval order or permit; the establishment by rule, of thresholds for determining the dimension and effects of dams which will be under department regulation.
I.C. § 455B.276 describes the powers of the department regarding the establishment of encroachment limits of flood plains, and states that the department shall also work with local governments in establishing encroachment limits, flood plain regulations, and zoning ordinances relating to flood plain areas within local jurisdictions. The power to promulgate rules and regulations is granted to the department in I.C. § 455B.278.

**Liability and Immunity**

One of the conditions for department approval of an activity or project listed in 567 I.A.C. 72.30 is that "No legal or financial responsibility arising from the construction or maintenance of the approved works shall attach to the state of Iowa or the agency due to the issuance of an order or administrative waiver".

**Definitions/Dam Classifications**

567 I.A.C. 70 defines *Flood Control Works* as "physical works such as dams, levees, floodwalls, and channel improvements or relocations undertaken to provide moderate to high degree of flood protection to existing or proposed structures or land uses". *Dams* are defined as barriers which impound or store water, and the term *height of dam* is defined in the same section as "the vertical distance from the top of the dam to the natural bed of the stream or watercourse measured at the downstream toe of the dam or to the lowest elevation of the outside limit of the dam if it is not across a watercourse". Criteria to be followed in defining a jurisdictional dam are found in 567 I.A.C. 71.3. In rural areas, such dams include: a) those designed with a permanent or temporary storage capacity of more than 50 acre-feet at the top of dam elevation, (or 25 acre-feet if the dam does not have an emergency spillway and has a height of 5 feet or more); b) dams with permanent storage in excess of 18 acre-feet and which have a height of five feet or more; dams across streams draining more than 10 square miles; and c) dams located within 1 mile of a municipality which are 10 feet or more in height, store 10 acre-feet or more at the top of the dam elevation and are situated such that the discharge from the dam will flow through the incorporated area. Dams located in urban areas meeting any of the requirements of a), b), or c) above are also jurisdictional dams, as are low head dams located on a stream draining 2 or more square miles in an urban area or 10 or more square miles in a rural area. Approval of the department for construction, operation or maintenance of a dam is required when the dam meets or exceeds the thresholds established by 567 I.C.A. 71.3 for rural, urban area, and low head dams. Certain modifications to existing dams and maintenance of pre-existing dams are also covered by this regulation. Hazard classifications are listed in 567 I.C.A. 72.3(2).

These include (for dams other than low head dams):

- **Low Hazard** - Structures located in areas where damages from a failure would be limited to the loss of the dam, loss of livestock, damages to farm outbuildings, agricultural lands, and lesser-used roads, and where loss of human life is considered unlikely.
- **Moderate Hazard** - Structure located in and areas where failure may damage isolated homes, industrial or commercial buildings, moderately traveled roads or railroads, and interrupt utility services, but without substantial risk of loss of life. Structures that of themselves are of public importance are also considered moderate hazard structures.
- **High Hazard** - Structures located in areas where failure may create a serious threat of loss of human life or result in serious damage to residential, industrial or commercial areas, important public utilities, public buildings, or major transportation facilities.
- **Multiple Dams** - Where failure of a dam could contribute to failure of downstream dams, the minimum hazard class of the dam is the same or higher than that of the downstream dams.

  a. **Abandonment**: Not defined.
  b. **Engineer**: Not defined.
c. **Hazard Potential**: Not defined.
d. **Operator**: Not defined.
e. **Owner**: Not defined.
f. **Person**: Not defined.
g. **Repairs**: Not defined.
h. **Spillway**: Not defined.

**Program Funding**
The laws and rules do not specifically address how the dam safety program is funded.

**Fees and Costs**
No fees accompany permit applications. No fees are assessed for agency inspections.

**Permit/Approval Process**
I.C. § 455B.278 gives the department the authority to establish a process by which permits shall be “issued, suspended, revoked, modified, or denied”, and provides for an appeal and hearing process. 567 I.A.C. 72.3 states that the department will approve the construction, operation or maintenance of a dam or modification of a dam or appurtenant structure only after finding that the project is designed in accordance with accepted engineering practices and methods. Several sections of regulations deal with the permitting process and related requirements. 567 I.A.C. 70.3 & 4 list the application forms and where they are to be submitted, and describe the requirements for certified engineering plans. Engineering plans shall include information on specifications, operation procedures, and environmental impacts, and must be certified by a registered professional engineer. No fees are charged with the applications.

567 I.A.C. 70.5 describes the application review process, including the initial screening, the order of processing, the project investigation, and provisions for the initial decision and appeal thereof. The project investigation involves an inspection, hydraulic review, solicitation of expert comments on environmental effects, notice to affected landowners, and a summary report. General criteria for all regulated dams are listed in 567 I.A.C. 72.3, and include determination that the dam was designed in accordance with the provisions of department Bulletin No. 16, “Design Criteria and Guidelines for Iowa Dams”, (December 1990). Other criteria listed in this regulation concern landowner notification and assignment of hazard class. Hazard classes are assigned based on the potential consequences of failure, and shall determine the design requirements of the structure. Details on the design criteria of design floods and embankments, special requirements for major dam structures, as well as hydraulic and structural criteria for spillways are found in Technical Bulletin #16.

Other important guidelines found in this publication are those relating to the preparation of project specifications, dam breach wave analysis, and the development of a written operating plan (required for any dam with gates or other moveable structures). Finally, 567 I.A.C. 72.3 requires that the determination of lands, easements, and rights-of-way necessary for the construction of a dam project be regulated as part of the design process, and provide guidelines for the acquisition of such. Separate approvals are required for the raising or lowering of impoundment water levels, and for the removal of dams. Regulations concerning these processes are found in 567 I.A.C. 73.2 and 73.11.

**Abandonment** – The abandonment of a dam, or the intent to permanently cease or cause to cease all acts of construction, operation, and maintenance of a dam, is prohibited. If any person wishes to be relieved of the responsibilities inherent in the ownership or control of a dam structure, those responsibilities shall be undertaken by another person through sale, transfer or other means or the dam shall be removed. 567 I.A.C. 73.10.

**Removal** – Agency approval is required to remove any dam which exceeds the thresholds in 567 I.A.C. 71.3. An applicant shall submit a written statement including:
- identification of the structure by name and location
- identification of the owner and, if the applicant is not the owner, evidence of authority to act for the owner
- the purpose for removal of the dam
- methods to be used in drainage of the impoundment and removal of the structure and appurtenances
- proposed final disposition of the impoundment site.

The agency review and approval process shall be as provided for review of operating plans in under 567 I.A.C. 73.1.

**Inspection Process**

[State]
The dam safety inspection program is described in 567 I.A.C. 73.20 through 73.26. Agency inspections are conducted to evaluate the construction, operation, and maintenance of dams, to identify deficiencies in dams, and to identify other structures or uses which may affect the hazard class or use of a dam. The department - for the purpose of determining whether a project complies with applicable criteria, and whether or not violations of permit regulations, law, or safety conditions exist - prepares inspection reports. Agency personnel inspect all major structures prior to construction (to determine hazard class), during construction, and when as-built plans and a construction report have been completed. Filling of the impoundment is not allowed until after the acceptance inspection has determined that the dam is consistent with approved plans and the conditions of the agency approval order, and a letter of acceptance has been issued. The regulations require that agency inspections be conducted on a regular basis: once every two years for high hazard structures and once every five years for other major structures. No fees are assessed for agency inspections. The agency shall notify the owner or agent prior to each inspection. Special inspections and investigations shall be made by department personnel upon notice or evidence of unauthorized construction, notice or evidence that a dam has failed or is in a condition where failure appears likely, notice or evidence that the hazard classification of a dam may no longer be valid due to changed downstream conditions, and at the time renewal of a storage permit is being considered.

[Owner]
Dam owners are responsible for annual maintenance inspections and submission of a written inspection report. Inspection requirements for permit approvals for major dam structures are provided for in detail in Department Bulletin #16, Chapter VI, and include the following: soils and foundation investigations, anticipated sedimentation rates, a dam breach wave analysis, a detailed inspection plan, and annual maintenance reports. A registered engineer must also inspect construction, and as-built plans shall be prepared and certified. Inspections of dams other than major structures, milldams, and pre-existing structures are provided for in 567 I.A.C. 73.21. Special inspections can be made by department personnel upon notice of the events or conditions listed in 567 I.A.C. 73.23.

**Right of Entry**
Right of entry is specifically authorized in 567 I.A.C. 73.25 as part of the dam safety inspection program.

**Operation and Maintenance**
567 I.A.C. 73.1 requires that an operating plan be approved by the department if the dam has movable structures which must operate during floods or to release a minimum downstream flow, or the impoundment water level is raised or lowered regularly or periodically. Requests for approval of an operating plan shall be submitted if it is required for a proposed new dam or
because of proposed structural modification of an existing dam, and if there is a change in use of
a dam and the change is not related to proposed structural modification of the dam. An
application for approval of an operating plan shall be supported by written information
identifying personnel responsible for operation of the dam, the circumstances under which gates
or other movable structures must operate, the method of operation, and the method of discharge
measurement. The department shall review applications in accordance with the procedures in
Chapter 70 of the rules.
Under 567 I.A.C. 73.22, the owner of a dam has a responsibility to maintain the dam and
appurtenant structures in a safe condition. The owner shall perform regular inspections to
identify potential maintenance problems.

Emergencies/Emergency Action Plans
567 I.A.C. 73.30 to 73.32 provide for procedures and criteria for designating a dam as unsafe, and
for agency action concerning an unsafe dam. If the initial agency report "requires emergency
remedial work to abate an imminent danger of failure, the director may request the assistance of
the attorney general to seek an appropriate judicial order compelling performance of emergency
remedial work". There are no direct references to emergency action plans in Iowa’s laws or
regulations.

Owner Non-Compliance/Violations/Penalties
I.C. § 455B.275(4)(5) authorizes the department to maintain an action in equity to enjoin a person
from erecting a structure for which a permit has not been granted. The department may also seek
judicial abatement of any structure erected or made without a permit, with the costs of abatement
to be born by the violator. The department is also authorized to remove, by action in
condemnation, a structure that adversely affects the efficiency or restricts the capacity of a
floodway. I.C. § 455B.279 describes the department’s powers relating to the initiation of legal
proceedings necessary to obtain compliance with the law or regulations, and subjects persons who
violate such to a civil penalty not to exceed $500 for each day that the violation occurs.

Recordkeeping
The rules provide that agency personnel shall prepare a report of each inspection and provide a
copy to the owner of the dam. An annual summary report of all dams inspected during the year
shall be presented to the department.

Oversight
I.C. § 455B.278 describes the process of appealing department orders approving or denying
permits, and orders necessary to secure compliance with or prevent a violation of regulations. In
both cases, persons affected by such orders may file a notice of appeal within 30 days of the
issuance of the order, and the appeal shall be conducted as a contested case according to the
provisions of Chapter 17A of the Iowa Code. 567 I.A.C. 70.6 gives further explanation of the
appeal process.

Miscellaneous
1. Dam safety laws are contained in the sections of the Iowa Codes dealing with Water Allocation
and Use. The majority of the statutes provide for the broader goals of development, use,
protection, and conservation of the State’s water resources, with dam safety being a part of that
larger purpose. Thus many of the statutes speak to water policy and planning issues, beneficial
use, coordination between levels of government regarding flood control, permits for diversion,
storage, and withdrawal of water, priority allocation of water rights, and well interference.
2. Dam safety regulations are contained in those sections of the administrative code dealing with
Flood Plain Development, thus embodying only one aspect of the established purpose of
"implementing a program to promote the protection of life and property from floods and to promote the orderly development and wise use of the flood plains of the State". Also contained in the regulations, specifically Chapters 71 and 72, are conditions for approval of bridges and culverts, channel changes, levees or dikes, treatment facilities, landfills, pipelines, buildings, and boat docks. 567 I.A.C. 72.50 and 72.51 describe the protected stream designation procedure, and a list of protected streams in the State.

3. Chapter 75 of the regulations explains the process of determining jurisdiction over specific dams and flood plain areas. The department regulates flood plain development in three ways: 1) by issuance of flood plain management orders for specific stream reaches; 2) by approval of flood plain management regulations adopted by local governments; and 3) on a case-by-case basis. Persons wishing to construct or maintain a structure, dam, obstruction, deposit or excavation or allow the same in a flood plain must contact the department to determine whether approval is required from the department or from the local government. 567 I.A.C. 75.1. The chapter also includes provisions for determining the flooding characteristics of specific streams, encroachment limits defining outer limits of floodways within flood plains, and minimum standards for flood plain and floodway uses.

4. Chapter 76 of the regulations describes the process of notification and coordination of efforts regarding federal water resource projects.

5. Technical Bulletin #16 is published by the department to provide the technical design criteria and guidelines used in reviewing applications for permits. It coordinates and gives references to related regulations, but also explains in detail the requirements for determining hazard classification, design floods and spillway capacities, the design of earth embankments, specifications, operating plans, the determination and acquisition of easements and right-of-ways, and special requirements for major structures. The bulletin also lists hydrologic and hydraulic design references from several sources.

6. Portions of Iowa Code Chapter 469 relating to regulation of milldams by the department of Natural Resources were repealed by 1990 Iowa Acts, Chapter 108. In effect, the legislation eliminated milldams as a separate class of dam and placed the regulatory control over such dams under the provisions of I.C. § 455B.275, the section of the Iowa Code which gives the department regulatory authority over all other types of floodplain development, including non-milldams.

   a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

   b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.

   c. Severability
   - The laws and rules do not specifically address severability.

   d. Supplemental Reference Materials

KANSAS

Summary
[Pros] The Kansas statute provides a clear, direct summary of the agency regulations and enforcement actions. Any structure that impounds more than 30 acre-feet of water is regulated. The Administrative Rules dedicate a large section to the potential impact on affected water channels and waterways. A “water structures fund” is created in the State Treasury to hold all moneys received under K.S.A. § 82a, (including inspection and permit fees) and shall be used to fund program expenditures appropriated by the director of the account. Subject to division approval for water storage or flood control usage, dams that qualify are entitled to specified exemptions from property taxes levied upon landowner’s land. Dam owners who grant the State easement or rights-of-way for purposes of storing water and flood detention storage are also entitled to such tax exemptions. During drought periods, the State may exercise its powers to access surplus waters stored in any privately owned reservoir. All dams – and “channel change or stream obstructions” – are under the jurisdiction of the Department of Agriculture. The Chief Engineer, or his/her authorized representative, of the division is the program administrator and may waive or impose regulations as necessary. The Chief Engineer must maintain a list of licensed professional engineers to review any applications for division permitting, any of whom may be used by an applicant, provided that the applicant does not employ the chosen licensed engineer. Dam plans and specifications govern all details of a dam, topography, cross sections of the dam (elevations), emergency spillway specifications, reservoir data, benchmarks, spillway discharge capacity, and drainage patterns below the dam site. The spillway specifications are particularly detailed. There is a deadline to notify applicants of permit approval or denial and judicial process to challenge permit denial. The Chief Engineer may determine permit terms, conditions, and restrictions as advisable. Upon finding an owner is in violation of the permit or regulations, the Chief Engineer may inspect a dam as deemed necessary. Fees are assessed for permit applications, State engineer inspections, and emergency remedial procedures. Upon emergency, the Chief Engineer may take control of any dam or structure until such hazards are abated. Dams built on private property for agricultural purposes as part of the federal agricultural conservation program may apply for exemption from regulation. The Kansas statutes covering water and watercourses are designed to protect the environment while facilitating safe usage; environmental impact must be considered during permitting process, but is not automatically a prohibitive factor. There is a severance clause in the statute providing that, if any part is found to be unconstitutional, the remaining part of the act shall not be invalidated.
[Cons] The dam classifications could be organized into a more concise format. Dam inspection frequencies are different as prescribed by the K.S.A. and K.A.R., yet both durations are longer than the regulatory norm (e.g. ‘High hazard’ dams: once every three (3) or five (5) years). Neither the statute nor rules explicitly address liability, recordkeeping, or dam operation and maintenance. The “Engineering Guides” provide additional technical information not found in these rules.

Citation and Title
[Administrative Agency] Division of Water Resources, Chief Engineer
**Jurisdiction/Powers of Department**

The Chief Engineer of the Division of Water Resources ("division"), Kansas Department of Agriculture is empowered by law to provide for the exclusive regulation of the construction, operation, repair or removal of all dams to the extent required to carry out the protection of public safety. K.S.A. § 82a-301a. It shall be unlawful for any person, partnership, association, corporation, agency, or political subdivision of the State government to construct, alter, or modify any dam or water obstruction, or to change or diminish the course, current, or cross section of any waterways without permit from the Chief Engineer. K.S.A. § 82a-301. The Chief Engineer is authorized to require and review all plans and specifications, plus any other materials requested in order to adequately approve or deny a permit for construction, repair, modification, or dam removal. The Chief Engineer may also determine terms, conditions, and restrictions of each permit. K.S.A. § 82a-303. The law gives the Chief Engineer authority to make rules and regulations, to enter private property to jurisdictional dams for the purpose of inspection, to require repairs if needed, and to take whatever action is necessary to preserve the public safety in the event of an emergency. K.S.A. § 82a-303a,b. The statute gives the Chief Engineer power to issue findings and orders, and specify corrective actions whenever a dam is found to be in violation of adopted regulations or terms, conditions or restrictions of a permit, or where conditions exist which may present a hazard to the public safety. The Chief Engineer also has the power to require the owner to pay for repairs as specified in the Chief Engineer's report, which contains all findings and required corrective actions. During periods of drought, county commissioners of this State may declare emergency resolutions and prescribe rules for obtaining surplus waters stored in privately owned reservoirs. Upon notice owners of such properties shall allow access upon their land as prescribed under these rules. K.S.A. § 82a-408.

**Liability and Immunity**

Nothing was found in the laws or regulations concerning owner or State liability.

**Definitions/Dam Classifications**

A *dam* is "any artificial barrier, together with appurtenant works, which does or may impound water." K.A.R. 5-40-1. According to K.A.R. 5-40-5, a jurisdictional dam has to impound more than 30 acre-feet of water at the top of the dam. *Height of dam* is "the difference in elevation between the top of the dam and the original streambed on the centerline of the dam." Effective height of dam is "the difference in elevation between the crest of the emergency spillway and the original streambed on the centerline of the dam." *(Engineering Guide-1 P.3).*

[Size Classifications]

*(Engineering Guide-1 P. 3-4 includes Classifications and definitions of the terms size factor, effective height, and effective storage.)* 1. Those dams whose effective height is less than 25 feet; effective storage is less than 50 acre-feet; and size factor is less than 1,350. 2. Those dams whose effective storage is greater than 50 acre-feet; and size factor is between 1,250 and 3,000. 3. Those dams whose effective storage is greater than 50 acre-feet; and size factor is between 3,000 and 30,000. 4. Those dams whose effective storage is greater than 50 acre-feet, with size factor greater than 30,000.

[Hazard Classifications]

(from *Engineering Guide - 1 P. 3-4).*

- **Class (a): Low Hazard** - dams located in rural/agricultural areas where failure may damage farm buildings, limited agricultural land, or county, township and private roads.
- **Class (b): Significant Hazard** - dams located in rural/agricultural area where failure may endanger few lives, damage isolated homes, secondary highways or minor railroads, or cause interruption of use or service of public utilities.
• **Class (c): High Hazard** - dams located in areas where failure may cause extensive loss of life, serious damage to homes, industrial and commercial facilities, important public utilities, main highways or railroads.

  a. **Abandonment**: Not defined.
  b. **Engineer**: Licensed professional engineer.
  c. **Hazard Potential**: Not defined.
  d. **Operator**: Not defined.
  e. **Owner**: Not defined.
  f. **Person**: Not defined.
  g. **Repairs**: Not defined.
  h. **Spillway**: Not defined.

**Program Funding**

A “water structures fund” is created in the State Treasury. All moneys received under K.S.A. § 82a-302 and 302b, (inspection and application fees) shall be deposited in this fund for use according to the Director of Accounts and Secretary of Agriculture. K.S.A. § 82a-328.

[Tax Credit]

Landowners in the State of Kansas who lawfully construct dams that form upon landowner’s land one or more reservoirs that may be used for the collection and storage of surface water or flood detention storage, and who shall maintain such dams to the satisfaction of the Chief Engineer, shall be exempt, to the extent specified under K.S.A. § 79-201g, (based on reservoir storage capacity), from property or ad valorem (i.e. proportional to the value of the real property) taxes levied upon such land. The total exemption amount for any single tract of land shall not exceed five thousand dollars ($5,000) or forty percent (40%) of the assessed value; whichever is the lesser. Such exemption is applicable for a period of ten (10) years after the original certification. Lands contiguous to or donated in connection with erection or maintenance of such dams or reservoirs, which the owner has donated to the State an easement or right-of-way shall also be exempt for levied taxes, in proportion to the value of such easement or right-of-way. The Chief Engineer must approve of dam or reservoir construction and operation prior to tax exemption eligibility. The Chief Engineer must submit detailed information of the dam, reservoir capacity, and specified land area to the county clerk, whom shall annually adjust the taxes levied against the landowner for the duration of their exemption eligibility period. K.S.A. § 79-201g, K.S.A. § 82a-405.

**Fees and Costs**

Persons applying for permit approval shall pay all costs associated with review by the licensed professional engineer. Fees for construction commenced prior to approval — in addition to other penalties — shall range from $200 to $500. Permit fees for waterway changes (e.g. dams) range from $100 to $1,000 and are based upon: (1) drainage area category, and (2) stage of construction when application was submitted. K.S.A. § 82a-302.

Annual inspections ordered by the Chief Engineer are at owner’s expense, ranging from $1,500 to $4,000, depending on hazard class, drainage area, and construction progress. The owner shall pay costs for any work required by the Chief Engineer prior to, or as a result of an inspection. If dam owners fail to conduct scheduled inspections, the Chief Engineer may order or conduct one at dam owner’s cost, in addition to other penalties. All fees collected pursuant to this statute shall be remitted to the State Treasurer. K.S.A. § 82a-303b.

**Permit/Approval Process**

The law gives the Chief Engineer the authority to approve or deny permit applications for construction, repair, modification, or removal of a dam. The law states that it is unlawful to
perform the above on a structure without prior permitting by the State. An application for permitting must include maps, plans and specifications, and profiles as required by the Chief Engineer. A licensed professional engineer, competent in dam design and construction, shall design all plans and specifications for dams. The Chief Engineer must maintain a list of such engineers, any of whom may be used by an applicant, provided that the applicant does not employ the chosen licensed engineer. These plans and specifications are to be submitted to the Chief Engineer for approval, who shall approve and grant the permit within forty-five (45) days, or deny the permit and notify the applicant in writing within fifteen (15) days. Denied applications must comply with the Kansas Administrative Procedure Act.

Plans and specifications for the dams and dam sites are thorough; including waterway channel changes, spillways, slopes, test pits, test holes, valves, wells, drains, benchmarks, and berms. They are outlined in K.A.R. 5-40-2, as are the required provisions for the drainage patterns below the dam, topography map requirements, dam cross sections, elevation, dimensions, benchmarks, and reservoir data. Specifications must be provided on 8½ x 11-inch white paper, and shall be according to currently accepted engineering practices. The preparer of all maps, plans, profiles, and specifications must be competent in dam design and construction, as well as comply with the requirements of the Kansas board of technical professions.

The regulations list requirements for plans and specifications. Certain minimum design standards such as spillway design criteria and structural requirements are detailed in Engineering Guides 1 and 2.

Detailed plans and specifications must be submitted for proposed structures that may potentially affect water channels. The estimated changes to such channels – water velocity, side slopes, erosion, disposal of excavated materials, vegetation impact, and stream obstruction – must be thoroughly measured and accounted for during the planning process. K.A.R. 5-41-1 thru 5-42-4. Plans for any sand dredging operations must also be submitted. K.A.R. 5-43-1 thru 5. Bridge and culvert projects are addressed in the regulations; setting guidelines for placement of structures, materials, design, permitting, specifications, sand and gravel removal, pipeline crossings, and other environmental impact issues. K.A.R. 5-46-1 thru 4.

Following construction completion of ‘high hazard’ dams, dam owners must submit drawings of the structure “as built.” K.A.R. 5-40-12.

The Chief Engineer may waive any of the regulations under these rules, if it is shown to his/her satisfaction that such waiver will not pose a hazard to public safety and that the waiver is in public interest, or may impose stricter requirements when necessary. K.A.R. 5-40-6.

**Inspection Process**

By law, the Chief Engineer shall have the power and is shall be his or her duty, or an authorized representative, to inspect any dam or other water obstruction. Upon finding that a dam is unsafe, the Chief Engineer shall order annual inspections of the dam until is it incompliance with the rules and permit conditions, or is removed. Such safety inspections shall be conducted by the Chief Engineer or authorized representative at dam owner’s expense. K.S.A. § 82a-303b.

Inspection schedules are as follows:

- **Hazard Class C:** once every three (3) years, unless otherwise ordered by the Chief Engineer
- **Hazard Class B:** once every five (5) years unless otherwise ordered by the Chief Engineer
- **Hazard Class A:** not specified

Within sixty (60) days of inspection, a report shall be provided to the Chief Engineer (assuming he/she wasn’t inspector) containing physical description of the dam, observed deficiencies, analysis of dam capacity and spillway works, dam compliance, observed changes since last inspection, assessment of hazard classification including engineer opinion, and other relevant...
information. If dam owners fail to conduct scheduled inspections, the Chief Engineer may order or conduct one at dam owner’s cost, in addition to other penalties. K.S.A. § 82a-303b. After construction of a new dam, regulations of the division, K.A.R. 5-40-13, require all high hazard dam owners to have their dams inspected by a professional engineer and a report submitted to the Division every five years or more frequently if requested by the Chief Engineer.

Right of Entry
For the purpose of conducting inspections, the Chief Engineer or authorized representative is authorized to access private property. K.S.A. § 82a-303b.

Operation and Maintenance
Principle spillway pipes must be tested according to K.A.R. 5-40-14 thru 16.

Emergencies/Emergency Action Plans
The law says that whenever conditions of any dam or other water obstruction are so dangerous to the safety of life and property as not to permit time for the issuance and enforcement of an order relative to construction, modifications, maintenance or operation thereof, or the passing of imminent floods threaten the safety of any dam, the Chief Engineer shall immediately employ any remedial means necessary to protect the public safety. The Chief Engineer shall remain in this capacity until the dam is rendered safe or the emergency has ceased. K.S.A. § 82a-303c[b]. K.A.R. 5-40-2k requires each application for a permit to construct a high hazard dam to include an emergency action plan.

Owner Non-Compliance/Violations/Penalties
If dam owners fail to conduct scheduled inspections, the Chief Engineer may order or conduct one at dam owner’s cost, in addition to other penalties. Failure to submit reports or conduct inspections is a violation. K.S.A. § 82a-303b. If an owner fails to comply with approved plans or conditions exist in dam construction, modification, or operation, the Chief Engineer may issue an order requiring the correction of such violations, including dam removal. Such order shall contain the violation and corrective actions. The Chief Engineer may immediately employ any means necessary to abate such problems, if found to pose an imminent threat to life or property, and may maintain control until such hazards are removed. K.S.A. § 82a-303c.

K.S.A. § 82a-305a provides that anyone operating a dam without a permit or in violation of any provision of the law is guilty of a Class C misdemeanor. Every day the violation occurs after notice is issued shall constitute a separate offense. At the request of the Chief Engineer, the Attorney General may bring suit against the violator to require the removal or modification of a dam. Fines and/or other penalties are not specified in the law.

Recordkeeping
Recordkeeping is part of the “Permit/Approval Process” provisions.

Oversight
Persons aggrieved by decisions of the Chief Engineer are entitled to judicial appellate review within the provisions of these laws. K.S.A. § 82a-302. The Act for Judicial Review and Civil Enforcement of Agency Actions, K.S.A. § 77-601 through 627, provides for appeal procedures of Chief Engineer decisions through court action.

Miscellaneous
a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
The environmental effect of any water development project – as defined under K.S.A. § 82a-326 – must be considered before such project is approved or permitted, however, nothing in the statute precludes approval or issuance of permit if such assessment determines adverse environmental effects may result. This act does not preempt or duplicate any existing environmental review processes otherwise provided or authorized by law. K.S.A. § 82a-327.

c. **Severability**
- If any part of this statute is found to be unconstitutional, the remainder shall remain in full force and effect. K.S.A. § 82a-410.

d. **Supplemental Reference Materials**
Dam regulations are also indicated in the “Engineering Guide-1, EG-1”, revised in 1986, and “Engineering Guide-2, EG-2”, revised in 1985, both published by the Kansas Division of Water Resources.

Other Publications by the State:

*Engineering Guide-1, EG-1*
*Engineering Guide-2, EG-2*

Kansas Guidelines for Development, Contingency Planning for Dam & Reservoir Emergencies
KENTUCKY

Summary
[Pros] There are no outstanding provisions in the Kentucky dam safety statute or regulations that are distinguished in this section.
[Cons] The statute and regulations provide minimal guidance to facilitate regulation inquiries and reference. The laws and rules do not mention an owner’s responsibility to inspect his/her dam. The laws and rules do not specifically address program funding. No filing fees or bonds are required by law or by regulation for permit application. Right of entry is not explicitly granted.

Citation and Title
[Statute] Kentucky's water resources law is contained in Kentucky Revised Statutes (K.R.S.) Chapter 151, Geology and Water Resources.
[Rules/Regulations] Regulations relating to dam safety are in Kentucky Administrative Regulations (Reg.) Chapter 4, Title 401, Water Resources.
[Administrative Agency] Natural Resources and Environmental Protection Cabinet

Jurisdiction/Powers of Department
The Secretary of the Natural Resources and Environmental Protection Cabinet is empowered by K.R.S. § 151 to exercise the following powers:
• administer and enforce the provisions of the law
• conduct investigations, research and training, and disseminate information regarding construction, operation or maintenance of dams and reservoirs; adopt rules and regulations, which have the force and effect of law, for flood control and the protection of water resources as well as regarding the procedural aspects of the dam safety program (i.e. hearings, reports, issuance of certificates of inspection and permits)
• issue orders requiring owners to take remedial actions necessary to protect life and property and to ensure compliance with laws and regulations
• examine and approve or disapprove applications for permits to construct, repair or alter dams
• establish standards for the safe construction, enlargement, repair, alteration, maintenance, or operation of a dam
• make investigations or inspections necessary to determine compliance, including the right to enter upon an area affected and the right of ingress and egress across intervening properties
• order the suspension or revocation of a certificate of inspection or permit for failure to comply with laws or rules
• order the suspension or revocation of a certificate of inspection or permit for failure to comply with laws or rules
• order the cessation of activity undertaken without proper approval or permits, and
• institute and prosecute court action for the purpose of obtaining enforcement of Cabinet orders. K.R.S. § 151.124.

Liability and Immunity
The law states that any person, city, county or other governmental subdivision who violates the law pertaining to dams shall be liable to a civil penalty of not more than $1,000 for said violation and in addition may be enjoined from continuing said violation. Each day constitutes as separate offense.
There are vague provisions in Kentucky law regarding liability of State personnel. It says that the State will provide legal and monetary assistance to the employee when a claim is entered against him except where the employee was not acting as an agent of the State. Just exactly how the State...
will provide a defense for its employees is unclear and could be reinterpreted by different administrations.

**Definitions/Dam Classifications**

K.R.S. § 151.100 defines the word *dam* to mean any artificial barrier, including appurtenant works, which does or can impound or divert water and which either (a) is or will be 25 feet or more in height and (b) has or will have an impounding capacity at maximum water storage elevation of 50 acre-feet or more. All such dams are subject to the provisions of K.R.S. § 151, and are regulated by the Kentucky Natural Resources and Environmental Protection Cabinet. Regulations define *dam height* as the distance in feet measured from the natural bed of the stream or watercourse at the downstream toe of the barrier to the low point in the top of the dam.

Hazard Classification Criteria - dams are assigned a structure classification according to the following criteria:

- **Class (A) Low Hazard** - Structures for which failure would result in loss of the structure itself, but little or no additional damage to other property.
- **Class (B) Moderate Hazard** - Structures for which failure would cause significant damage to property and project operation, but loss of life is not envisioned.
- **Class (C) High Hazard** - Structures for which failure would cause loss of life or serious damage to homes, commercial buildings, utilities, highways or railroads.

(The structure classification and other definitions are found in the cabinet publication *Design Criteria for Dams and Associated Structures*, March 1975)

- **a. Abandonment**: Not defined.
- **b. Engineer**: Not defined.
- **c. Hazard Potential**: Licensed Professional Engineer.
- **d. Operator**: Not defined.
- **e. Owner**: Any person who owns an interest in, controls, or operates a dam.
- **f. Person**: Any individual, public or private corporation, political subdivision, government agency, municipality, co-partnership, association, firm, trust, estate or other entity whatsoever.
- **g. Repairs**: Not defined.
- **h. Spillway**: Not defined.

**Program Funding**

The laws and rules do not specifically address program funding.

**Fees and Costs**

No filing fees or bonds are required by law or by regulation for permit application.

**Permit/Approval Process**

According to K.R.S. § 151.250, the construction, reconstruction, relocation or improvement of dams in Kentucky may only take place if the plans and specifications for such work have been submitted to and approved by the cabinet, and a permit issued. Exceptions included those projects which are not large enough to require approval in the interest of safety or retention of water supply, and those over which the Kentucky Department of Surface Mining Reclamation and Enforcement has issued a permit under provisions of K.R.S.§ 350. All applications for permit shall be in the form and manner prescribed by the department. A licensed professional engineer must draw plans and specifications. The department shall notify the applicant in writing within 20 days either of approval or denial, or that modifications in the plans or specifications are necessary before the permit can be approved. K.R.S. § 151.250-260
and Reg. 401-KAR-4:030. All plans and specifications must bear the seal and signature of the responsible engineer and must comply with standards as set forth in the Kentucky rules and Design Criteria for Dams and Associated Structures. All structures (other than Class A structures) shall have subsurface investigations and soil analyses. Plans and specifications must include elevation-area-capacity and elevation-discharge data and flood routings, as well as determinations of downstream water requirements and the means to empty the impoundment. The permit approval process concludes with the issuance of a construction permit, constituting approval of the engineering plans and allowing construction to begin. During construction, monthly progress reports and testing reports must be prepared by the supervising design engineer and submitted to the cabinet. Reg. 401-KAR-4:030. After construction is finished and final approval of all as-built plans is given, written approval to impound is issued. No filing fees or bonds are required by law or by regulation for permit application.

Inspection Process
[State] The cabinet conducts a program of regular inspections of dams and reservoirs in the State and determines the frequency for such inspections. K.R.S. § 151.293 provides that within 60 days of completing an on-site inspection of an existing dam, the cabinet prepares an inspection report indicating whether or not the dam meets operation and maintenance. The cabinet may impose conditions relating to inspection, operation or maintenance, and it may modify an inspection report or the conditions attached to it. State law requires the cabinet to inspect each Class A dam at least once in 5 years. Cabinet guidelines call for each Class C and B dam to be inspected once in 2 years. [Owner] There is no provision in the law or regulations concerning owners' inspection frequency except in cases of staged renovation where the frequency and type of inspection is developed on a case-by-case basis (by law).

Right of Entry
The laws and rules do not specifically address right of entry.

Operation and Maintenance
K.R.S. § 151.293 sets forth that items of general maintenance of a dam shall include provisions for at least the following: dams shall be moved regularly; dams shall be free of trees and brush; animal burrows shall not be allowed on dams; slides, erosion and cracks that could pose problems to dams shall be properly repaired; action shall be taken to alleviate excessive wetness and abnormal seepage; appurtenances that are necessary for the proper operation and maintenance of the dam shall be kept in proper working condition.

Emergencies/Emergency Action Plan
According to K.R.S. 151.297, the cabinet may declare that an emergency exists if there is a danger to life and property from an unsafe dam and shall take such actions as set forth in the law to render the dam safe. Actions included but are not limited to taking control of the dam, lowering the water level or emptying the reservoir, performing necessary remedial or protective work, or removing the dam. The department is authorized to continue such action until the emergency has ceased. K.R.S. § 151.297[2,3]. K.R.S. § 151.299 places liability for the costs of such repairs on the dam owners, and authorizes liens, civil action, and foreclosure to satisfy the debt.

Owner Non-Compliance/Violations/Penalties
The cabinet, if it determines that a dam is not in compliance with state dam safety requirements, shall order the owner to take such action as is needed to render the dam safe. If the cabinet determines that a dam has been abandoned, or if the owner fails to comply with the cabinet's order to take action, or if danger to life and property is imminent, the cabinet may declare an
emergency and take action itself. Persons to whom an order has been issued must comply immediately, but may petition for a hearing in front of the cabinet. K.R.S. § 151.297. The owner or owners of a dam at which the cabinet has taken emergency action are liable for the costs of such action. K.R.S. § 151.299. I.R.S. 151 requires the cabinet to place a lien on the owner's property, and to file court action for recovery of the costs. The cabinet may apply for foreclosure sale of the property to satisfy any judgment obtained. K.R.S. § 151.297.

**Recordkeeping**
Recordkeeping is addressed through other sections.

**Oversight**
Appeals may be filed by owners regarding any order by the cabinet. Within 30 days of the order, the appeal must be taken to the circuit court of the county where the structure is located. The Cabinet shall be named respondent and service shall be had on the Secretary. The circuit court shall review and make decisions concerning the appeal. The findings of the cabinet shall be prima facie evidence of the facts of the case. K.R.S. § 151.186.

**Miscellaneous**
- **Complaints to Unsafe Conditions**
  - The laws and rules do not specifically address complaints to unsafe conditions.
- **Environmental Impact**
  - The laws and rules do not specifically address environmental impact.
- **Severability**
  - The laws and rules do not specifically address severability.
- **Supplemental Reference Materials**
  *Design Criteria for Dams and Associated Structures*, March 1975
LOUISIANA

Summary
[Pros] These rules emphasize assessing the foreseeable consequences of dam failure and magnitude of flooding resulting from such failure. Initially, it is the owner’s responsibility to establish hazard classification. All dams will be considered High Impact Potential until demonstrated otherwise, i.e., the owner must provide documented analysis. The application for a permit must be submitted with formal engineering designs and calculations, supported by sufficient field information. The regulations specifically set out what a complete design package consists of including Hydrology and Hydraulics Design, Geotechnical Design, and Structural Design. The owner must also establish the magnitude of the meteorological event on which the entire design is to be based. The administrative rules provide exceptional guidance regarding this subject including a detailed definition of Inflow Design Flood (IDF) and Probable Maximum Flood (PMF). In addition, the administrative rules define IDF and PMF for each hazard classification.

The administrative regulations also set forth mandatory procedures to ensure adequate geotechnical design including field investigation to define the soils and ground water conditions with respect to stability and seepage control; stability analysis to consider after-construction conditions; and long-term seepage, partial pool, and laboratory tests.

An Emergency Preparedness Plan is required for all dams and reservoirs.

[Cons] The rules do not provide a comprehensive “definitions” section. There is no mention of how the Dam Safety Program is funded or if permit fees exist.

Citation and Title
[Statute] Laws pertaining to the dam safety program are found in Louisiana Revised Statutes (L.R.S.) 38:21-28, effective 1981 and last amended in 1993.


[Administrative Agency] The Public Works and Flood Control Directorate is responsible for administering the Dam Safety Program. The Department of Transportation’s Water Resources Design and Development Section operates the program, Chief Engineer.

Jurisdiction/Powers of Department
It is the responsibility of the State to provide a means for the inspection, regulation, and supervision of all present or future dams within the state. L.R.S. § 38:21. All dams, both federal and non-federal but excluding the Toledo Bend Dam, shall be under the jurisdiction of the State acting through the Chief Engineer of the Department of Transportation and Development, office of public works. The Chief Engineer, or his authorized representative shall have supervision and overview of the construction, modification, operation, and maintenance of the dams to the extent required to protect life and property and to provide for the safety and welfare of the public. L.R.S. § 38:23. The Chief Engineer shall adopt and may amend rules and regulations in order to establish standards for construction, maintenance, modification, and operation of dams. L.R.S. § 38:24.

The right of the State to take over a dam in the event of an emergency situation is stated in L.R.S. § 38:26B. The State does have the authority to invoke judicial action upon violators of provisions. L.R.S. § 38:28.

Liability and Immunity
No action may be brought against the State of Louisiana, its agencies, or its agents and employees
for the recovery of damages caused by the partial or total failure of any dam or reservoir or through the operation of any dam on the basis that such defendant or defendants is liable to the claimant because of the approval of the dam, or its operation, control or regulation, or emergency measures taken. L.R.S. § 38:27.

**Definitions/Dam Classifications**

A *dam* is “any artificial barrier, including appurtenant works, which does or will impound or divert water or any other liquid substance and which (1) is or will be twenty-five or more in height from the bed of the watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation; or (2) has or will have an impounding capacity at maximum water storage elevation of fifty acre-feet or more.” L.R.S. § 38:22. The term “dam” and “impoundment structure” are used interchangeably.

**Dam height** – measured from the natural bed of the stream or watercourse at the downstream toe of the barrier, or if it is not across a stream or watercourse, the height from the lowest elevation of the outside limit of the barrier, to the top of the dam. L.A.C. § 2101(D).

Dams are also classified according to "impact potential":

<table>
<thead>
<tr>
<th>Impact Category</th>
<th>Potential Loss of Life</th>
<th>Potential Economic Loss</th>
<th>Minimum Inflow Design</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Not Likely</td>
<td>Minimal</td>
<td>50-yr. frequency</td>
</tr>
<tr>
<td>Significant</td>
<td>Possible</td>
<td>Appreciable</td>
<td>100-yr. frequency</td>
</tr>
<tr>
<td>High</td>
<td>Likely</td>
<td>Excessive</td>
<td>½ PMF</td>
</tr>
</tbody>
</table>

a. **Abandonment**: Not defined.
b. **Engineer**: Not defined.
c. **Hazard Potential**: Not defined.
d. **Operator**: Not defined.
e. **Owner**: Not defined.
f. **Person**: Not defined.
g. **Repairs**: Not defined.
h. **Spillway**: Not defined.
   i. **Auxiliary or Emergency Spillway**: a secondary spillway designed to operate only during unusually large storm events as being equal to the 100 year storm event or larger.
   ii. **Spillway Crest**: the overflow section or top of weir section of the spillway.

**Program Funding**
The laws and rules do not specifically address program funding.

**Fees and Costs**
No filing fees are required by law or by regulation for permit applications.

**Permit/Approval Process**
No person, partnership, association, corporation, agency, or political subdivision shall make, construct, or permit to be made or constructed any dam or change in any dam without the written consent or permit of the Chief Engineer. Initially, an applicant or his engineer shall submit a “letter of intent” to the D.O.T.D. The applicant or engineer will then submit a “Pre-Application for Construction of Dam.” The applicant will then publish a “Notice of Application” and a public hearing will be held. The applicant will then submit designs, plans and specifications and “An Application for Construction of Dams.” All designs for work to be permitted under the permit...
program will be submitted for review and approval with all necessary supportive documentation. The documentation required shall be formal engineering designs and calculations, supported by sufficient field information. A registered, professional engineer must prepare plans and specifications and certify by professional seal. The designs must conform to nationally recognized standards. The completed design package will state the intended design life of the structure and will include the operations and maintenance necessary to ensure that the structure will function as designed for its stated design life. L.A.R § 2101(G).

After an application has been filed and the general designs have been approved, the applicant may proceed with plans and specifications, which will also require approval before construction will begin. Inspections shall be completed as directed at the owner's expense. Filing fees are not currently assessed.

**Inspection Process**

[State] In order to secure conformity and assure compliance with permits, the Chief Engineer or his authorized representative shall inspect all dams under his jurisdiction. L.R.S. § 38:24. The Chief Engineer shall make periodic inspections during dam construction. Inspections made by the Chief Engineer are “limited inspections” and do not relieve the owner or the owner’s engineer from their responsibilities for conform to accepted designs and procedures. L.A.R. § 2101(H)(2).

[Owner] Owner inspection requirements are contained in the "Maintenance and Operation Manual". The owner is responsible for certifying to the D.O.T.D., through properly documented records, that required periodic inspections have been made, for correcting any deficiencies revealed during such inspections, and for maintaining records of all operations and maintenance activities.

**Right of Entry**

The Chief Engineer or his authorized representative shall have the right of access to private property in order to make inspections of such dams. L.R.S. § 38:24.

**Operation and Maintenance**

No permit is required for routine maintenance. L.R.S. § 38:23.

Regular maintenance in accordance with the approved Operations and Maintenance Manual (OMM) is required to maintain structure. The OMM is provided by the designer and should contain forms and schedules for records and documentation of inspections, maintenance procedures, and repairs.

**Emergencies/Emergency Action Plan**

The dam or reservoir owner shall submit an Emergency Action Plan and it shall be the owner's sole responsibility to carry out the provisions of the plan in the event of an emergency.

**Owner Non-Compliance/Violations/Penalties**

If, after inspections, the Chief Engineer finds conditions that violate the adopted rules and regulations or any permit or consent by the Chief Engineer, he shall issue an order to require the correction of any such violation by the owner or operator of the dam. The Chief Engineer shall also revoke prior approval permits. If corrective measures are not accomplished within the specified time, an order may be issued to require the safe removal of the dam. L.R.S. § 38:26.

When the condition of a dam is so dangerous to the safety of life and property as not to permit the issuance of an order, the Chief Engineer shall immediately employ any remedial means necessary to protect the safety of life and property. The dam shall remain under the control of the Chief Engineer until it is rendered safe. The owner, governmental agency, or operator thereof shall pay for the costs of any work performed by the Chief Engineer, for the purpose of restoring the dam to the statutory/administrative requirements.
It is unlawful for any person to violate any provisions of the Chapter relevant to dams or any provision of the orders, rules, regulations, or lawful requirements of the Chief Engineer. Any willful violations shall be guilty of a misdemeanor and shall be fined not more than five hundred dollars or be imprisoned not more than six months or both. L.R.S. § 38:28.

Recordkeeping
It is the owner’s responsibility to maintain adequate records that document all materials and construction procedures meet or exceed those specified. The owner shall report on the construction to the D.O.T.D. L.A.R. § 2101(H). The owner is responsible for certifying to the D.O.T.D., through properly documented records, that required periodic inspections have been made, for correcting any deficiencies revealed during such inspections, and for maintaining records of all operations and maintenance activities.

Oversight
The owner shall be given full opportunity for a hearing prior to the issuance of any order revoking or modifying previous approval.

Miscellaneous
a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.

c. Severability
   - The laws and rules do not specifically address severability.

d. Supplemental Reference Material
   a. LADOTD Dam Maintenance Program
   b. LADOTD Dam Safety and Regulatory Program
   c. LADOTD Dam Safety Rules and Regulations Booklet
   d. Dam Safety Training Manuals
MAINE

Summary
[Pros] The Code of Maine Rules (C.M.R.) and Maine Revised Statutes (M.R.S.) are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. The permit application process is clearly set out under C.M.R. 15-214-003. The rule provides criteria for the design, including the design flood and the spillway design, investigation, foundations, construction materials, surveys, and hydrologic calculations to be included the Final Design Report. In addition, 37-B M.R.S. § 1130 provides for a Dam Repair and Construction Fund. The fund provides low-interest loans to municipalities for engineering, legal and construction costs involved in acquiring title to, establishing long-term management plan for, repairs to, reconstruction of, breaching of or removal of a dam. The fund is, however, established within the department and the department administers the fund.

[Cons] Inspection of existing dams is primarily the responsibility of the department. The commissioner is statutorily obligated to inspect the structural stability and function of significant and high hazard potential dams, as well as evaluate all dams to assign a hazard potential classification. 37-B M.R.S. §§ 1118, 1119; C.M.R. 01-001-375. Neither the C.M.R. nor the M.R.S. address whether permit application fees are assessed. Although a definitions section is found under 37-B M.R.S. § 1111, the section provides minimal definitions.

Citation and Title
[Statute] Law regarding dam safety and inspection is found in Maine Revised Statutes Title 37-B “Defense, Veterans and Emergency Management” sections1051-1070, Chapter 21 “Dams and Reservoirs”, and Chapter 22 “Dam Inspection.
[Rules/Regulations] Rules are found in the regulations Chapter 3 “Design and Construction Standards for New or Reconstructed Dams.” Laws regarding registration, abandonment, and water level regulations are governed by the Maine Dam Registration, Abandonment, and Water Level Act of 1983 Title 38 “General Provisions Relating to Rivers and Streams”, Chapter 5, Subchapter 1 “Mills and Dams” sections 611 - 933 as applicable.

Jurisdiction/Powers of Department
The department shall inspect existing dams and reservoirs to determine their hazard potential, review the design and construction of new and reconstructed dams, assist dam owners in developing emergency action plans to minimize the effects of dam failure and take all necessary actions in emergency situations of probable dam failure in order to protect life and property. 37-B M.R.S. § 1113. The department may adopt, modify or repeal rules for carrying out this chapter. 37-B M.R.S. § 1114.

The department has sole jurisdiction of the design standards for all dams, except those licensed or inspected by an agency of the federal government. 37-B M.R.S. § 1115. The commissioner shall appoint or hire one or more dam inspectors who are licensed as professional engineers and who are experienced in the inspection and design of dams.
MEMA has the authority order a dam inspection at any time and to appoint and hire inspectors to carry out these State inspections. MEMA has the responsibility by law to inspect high and significant hazard dams and dams that are potential safety threats. MEMA is required to honor petitions from third parties for inspections of potentially unsafe dams and has the authority to accept or reject these petitions after investigating the situation. MEMA has the responsibility to ensure “competent operations” of a dam during transfer of ownership to ensure safe dam
maintenance and operation. The law gives MEMA right of entry onto private property in order to conduct an inspection. MEMA has the authority to order the owner to make alteration to high and significant hazard dams (the law lists what type of alterations may be ordered) and to enforce that order by appropriate remedy and may initiate civil action against the owner for non-compliance. MEMA is responsible by law for reevaluating hazard potential of dams every 6 years and for reclassification if necessary and is empowered to require a dam owner to submit an emergency operations plan for dams of high and significant hazard, updated every 2 years. 37-B M.R.S. § 1069. MEMA has the power to adopt rules and regulations to carry out the provisions of the law. It also has the power to require the assistance of other state agencies in the event of an emergency. 37-B M.R.S. § 1053. [DEP Powers] DEP is empowered by law to establish water level regimes, regulate water levels, and establish minimum flow requirements. It establishes water level regimes and the regulation of those regimes.

**Liability and Immunity**
The owners, lessees, or persons in control of the dam shall be jointly and severally liable for any costs incurred by the department in enforcing any order issued. 37-B M.R.S. § 1120. If the owner of the dam refuses to comply or does not fully comply with the department’s order, the department shall initiate a civil action. Nothing in the laws or rules relieves any person from duties, responsibilities or liabilities imposed by any other statute, regulation, municipal ordinance or any rule or law. 37-B M.R.S. § 1125. No action may be brought against the State, the board, the commissioner, or his agents for the recovery of damages caused by any order of the board or commissioner or by the partial or total failure of any dam or through the operation of the dam or any measures taken to ensure its integrity. 37-B M.R.S. § 1124.

**Definitions/Dam Classifications**
Maine laws define a dam as any artificial barrier, including appurtenant works, the site on which it is located and appurtenant rights of flowage and access, that impounds and diverts water and that is: (a) 25 feet or more in height from the natural bed of the watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier to the maximum water storage elevation and impounds at least 15-acre-feet of water; or (b) is 6 feet or more in height from the natural bed of the watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier to the maximum water storage elevation and has an impounding capacity at maximum water storage elevation of 50 acre-feet. Dam height the structural height of a dam, which is defined as the vertical distance from the natural bed of the stream or watercourse measured at the downstream toe of the dam to the top of the dam. The law exempts dams from state regulation that are licensed or under the jurisdiction of the Federal Energy Regulatory Commission or the International Joint Commission. Dams are classified by hazard potential in the latest rules amendments (Maine use the Corps’ hazard classification criteria):

<table>
<thead>
<tr>
<th>Category</th>
<th>Urban Development</th>
<th>Economic Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low Hazard</td>
<td>No permanent structures for human habitation.</td>
<td>Minimal (undeveloped to occasional structures or agriculture)</td>
</tr>
<tr>
<td>Significant Hazard</td>
<td>No urban development and a small number of habitable structures.</td>
<td>Appreciable (notable agriculture, industry or structures)</td>
</tr>
</tbody>
</table>
High Hazard Urban development with more than a small number of habitable structures.

Excessive (extensive community, industry or agriculture)

a. **Abandonment**: Not defined.
b. **Engineer**: Not defined.
c. **Hazard Potential**: The possible adverse incremental consequences that result from the release of water or stored contents due to failure of the dam or mis-operation of the dam or appurtenances. The hazard classification of a dam does not reflect in any way on the current condition of the dam and its appurtenant structures.
d. **Operator**: Not defined.
e. **Owner**: The owner of the land on which is situated, and/or the holder of an easement permitting the construction of a dam and/or any person or entity agreeing to maintain a dam, which includes the State or any of its political subdivisions, including, but not limited to sanitation district commissions and authorities, and public or private institution, corporation, association, firm, or company organized or existing under the laws of this or any other state or country, or any person or group of persons acting individually or as a group.
f. **Person**: Any individual, firm, association, partnership, corporation, trust, municipality, quasi-municipal corporation, state department, federal department or other legal entity.
g. **Repairs**: Not defined.
h. **Spillway**: Not defined.

Program Funding
The law provides for a Dam Repair and Construction Fund. The fund provides low-interest loans to municipalities for engineering, legal and construction costs involved in acquiring title to, establishing long-term management plan for, repairs to, reconstruction of, breaching of or removal of a dam. The fund is established within the department. The department shall administer the fund and make low-interest loans from the fund for the purposes pursuant to the dam safety laws. The department has jurisdiction to adopt rules to implement this fund, including criteria and procedures for the application for and award of low-interest loans. Any balance in the fund at the end of the fiscal year will not lapse, but will carry forward to the next fiscal year. 37-B M.R.S. § 1130.

Fees and Costs
No mention of fees in the statute or regulations.

Permit/Approval Process
By law, the construction, alteration, repair, or removal of a dam must be approved in writing by MEMA. Complete application procedures are included in the regulations including requirements for a preliminary report containing construction schedules, the engineer's certification, zoning authorizations and mappings. C.M.R. 15-214-003.1.
An owner shall file with MEMA, on forms provided by MEMA, a statement concerning the location, purpose, impounding capacity, and height of the existing or proposed impounding structure. C.M.R. 15-214-003.41. The owner shall also file a written Preliminary Report. The Report shall include: (1) a general description of the impounding structure and a proposed classification; (2) a description of the properties located in the inundation zone; (3) a statement from the governing body of the local political subdivision stating that they are aware of the intent to build; (4) maps showing the general location of the proposed structure; (5) preliminary
drawings; (6) preliminary design criteria; (7) the owners written request for preliminary and final inspection; and (8) written documentation by the owner’s engineer certifying that dam construction will be consistent with final design plans and as-built plans. C.M.R. 15-214-003.42. MEMA shall accept, review, and notify the owner within 45 working days whether the Preliminary Design Report is acceptable.

After the Preliminary Report is filed, the owner must file a Final Design Report. The Final Design Report shall include: (a) a report of geotechnical investigations of the foundation soils or bedrock and of the materials to be used to construct or reconstruct the impounding structure; (b) design assumptions and analysis to indicate the stability of the impounding structure; (c) confirmation of the stability of the reservoir rim area; (d) design assumptions and analyses to indicate that seepage will be reasonably controlled; (e) calculations and assumptions relative to spillway design; (f) provision to ensure protection against deterioration or erosion due to freezing and thawing; (g) other pertinent design data; and (h) plans and specifications. MEMA shall accept, review, and notify the owner within 45 working days whether the Preliminary Design Report is acceptable. The same procedure is followed for the Final Design Report (i.e. MEMA shall notify the owner within 45 days whether the Final Design Report is acceptable).

Transfer of Ownership. The law requires 45 days notice of the change of ownership of high and significant hazard potential dams along with the name and address of the new owners and any plan they have for maintaining “competent operations” and compliance with all safety, environmental and water level orders. 37-B M.R.S. § 1128.

Inspection Process
[State] MEMA

The law requires that the state dam inspector inspect all significant and high hazard potential dams to determine whether the integrity, structural stability, function or operation of those dams constitutes a threat to public safety. The inspector shall conduct an investigation of: (a) all significant hazard potential dams, at least once every 4 years; (b) all of high hazard potential dams, at least once every 2 years; (c) any dam, within 30 days of a request for an inspection from the dam owner or the municipality in which the dam is located; and (d) at any time any dam that may, in the judgment of the commissioner, constitute a potential risk to public safety.

The commissioner is also required to inspect a significant or high hazard potential dam within 30 days of receipt of a notice of transfer of ownership. The director shall provide a condition report to the commissioner detailing the condition of the dam and recommending all necessary remedial measures. The commissioner will send a copy of the report to the owner, lessee or other person in control of the dam. The owner, lessee or other person in control of the dam, must notify the commissioner within 20 days of receipt of the report if the owner disagrees with the findings. The owner must provide a basis for the disagreement within 3 months receipt of the report. 37-B M.R.S. § 1119.

The director shall also reevaluate the hazard classification of a dam on the following schedule and, if necessary, reclassify the dam to account for conditions downstream of the dam:
A. New or reconstructed dams, within 6 months of construction or reconstruction;
B. All other dams, at least once every 6 years;
C. Any dam, within 30 days of a request for an evaluation from the dam owner, the municipality in which the dam is located or the emergency management director of the county in which the dam is located; and,
D. At any time a dam for which, in the judgment of the commissioner, such an evaluation is appropriate. 37-B M.R.S. § 1118.

In addition, the commissioner shall evaluate the hazard classification of a significant or high hazard potential dam within 30 days of receipt by the commissioner of a notice of transfer of ownership of the dam.
The purpose of the inspections is to reevaluate and ascertain the downstream hazard classification of each dam. Each dam inspected under this section must be classified pursuant to the hazard potential of the dam. The principal criterion used to determine the hazard classification of the dam must be the potential risk to public safety and property downstream of the dam that may be affected directly or indirectly by the failure of the dam. The standards of classification of dams must be the same as those adopted by the United States Army Corps of Engineers, as set forth in 33 Code of Federal Regulations, Chapter II, and all subsequent amendments thereto.

The state dam inspector is required to issue a report making a recommendation regarding the classification of each dam to the director. A copy of the report must be provided to the dam owner of record and forwarded by certified mail. The dam owner shall notify the agency within 30 days of receipt of the report if the owner disagrees with the conclusions of the State's classification recommendation. If the owner of the dam does not agree with the results and recommendations of the dam inspector, the owner may at the owner's expense hire a registered professional engineer to conduct an independent investigation to determine the hazard classification of the dam. The dam owner shall provide the results of this independent investigation to the director within 6 months of receipt of the original report. The owner may apply for and be granted an extension of this deadline by the director for good cause. A State dam inspector shall review and consider the information provided by the owner's report pertaining to the classification of the dam and may issue a new classification recommendation. After reviewing all available data, the director shall then determine the classification of the dam.

[Owner] If the director determines that a dam is an imminent threat to the safety of the public, the director may order the owners, lessees or persons in control of the dam to make alterations to the dam to correct unsafe conditions and/or its operations, including, but not limited to: a) breach or removal of the dam; b) repair or maintenance of the dam; c) operation of the dam in a specified manner; d) preparation of and adherence to an emergency operations plan satisfactory to the agency; or e) maintenance of appropriate records relating to water levels, dam operation and dam maintenance. A dam owner must employ a registered professional engineer to inspect the dam if there is a question about hazard classification or to conduct investigations pertaining to the operation, repair, or construction of his dam. 37-B M.R.S. § 1119.

Right of Entry
In making investigations or inspections, the department or its representative, in an emergency situation, may enter upon public or private property. In non-emergency situations, the department or its representative, may secure administrative warrants from any District Court Judge or Superior Court Justice for the purpose of gaining entry onto private property. 37-B M.R.S. § 1114.

A State dam inspector and any department staff member must have full access to any dam site under the commissioner's jurisdiction for the purpose of conducting an inspection or enforcing an order. § 1126.

The owners, lessees or persons in control of a dam must have access over land abutting the dam site owned by others if the access, including the passage of vehicles, machinery and equipment, is reasonably necessary to comply with an order issued. § 1126. The owners, lessees or persons in control of the dam may not hold the abutters liable to any person for any personal injuries or property damage from the crossing of their land.

Operation and Maintenance
Refer to “Inspection Process” above.

Emergencies/Emergency Action Plan
Within 6 months of the state dam inspector determining the dam is of high or significant hazard potential, the owner is required to submit an emergency action plan and update it every 2 years.
37-B M.R.S. § 1127. The department must review the plans for adequacy. These plans are required to be kept and available on file at the local county offices. 37-B M.R.S. § 1069. The laws also require MEMA to develop contingency plans for safe passage of water prior to a flood condition.

When an emergency situation arises, the commissioner shall warn the public of the emergency and shall take all actions necessary to protect life and property including taking full charge and control of any dam or reservoir; lowering the water level by releasing water from the reservoir; completely emptying the reservoir; breaching or removing the dam itself; and taking other necessary steps to safeguard property. 37-B M.R.S. § 1114.

Owner Non-Compliance/Violations/Penalties
The board may enforce any order issued by any appropriate remedy, including, but not limited to, entering the dam premises to carry out the terms of the order. The violation of any order issued shall be a civil violation punishable by a forfeiture of not less than $100 and not more than $5,000. Each day of violation shall be considered a separate offense 37-B M.R.S. § 1129.

In the event of a violation of the provisions of this chapter or of any rule, order or decision of the department, the department may institute injunctive proceedings or other civil action as provided.

Recordkeeping
Recordkeeping is addressed in other sections.

Oversight
Any person aggrieved by an order of MEMA may appeal to the Superior Court under the Maine Administrative Procedures Act, Title 5, chapter 375, sub-chapter VII.

Miscellaneous
a. Complaints to Unsafe Conditions
- The laws and rules do not specifically address complaints to unsafe conditions.
b. Environmental Impact
- The laws and rules do not specifically address environmental impact.
c. Severability
- The laws and rules do not specifically address severability.
d. Supplemental Reference Material
- The laws and rules do not specifically address supplemental reference materials.
MARYLAND

Summary
[Pros] The Maryland Environmental Code and the Code of Maryland Regulations are organized in a clear, reasonable, and efficient structure to facilitate permit application inquiries. These rules also clearly set forth structure classification and design criteria including inflow design flood criteria, spillway design criteria, and overall design specifications. Under the rules, the owner is responsible for the safety of the dam.
[Cons] These rules do not, however, facilitate inspection, operation, or maintenance inquiries. The laws and regulations do not explicitly state that the owner of an existing dam must have an "Emergency Action Plan." Applicants for a permit are required to submit a "warning plan" for Category I and Category II (high and significant hazard) dams as part of the Construction Phase of the permit application. Also, these rules do not indicate where funding for the Dam Safety Program originates or what State agency oversees and appropriates Dam Safety Program funds.

Citation and Title
[Statute] The laws are found in the Maryland Environmental Code (M.E.C.), Title 5. Water Resources, Subtitle 5. Appropriation or Use of Waters, Reservoirs, and Dams (Md. Environment Code Ann.)
[Rules/Regulations] The Maryland dam safety regulations are contained in the Code of Maryland (COMAR) Regulations 1988, Title 26; Maryland Department of the Environment, Subtitle 17; Chapter .04, Construction on Non-Tidal Waters and Floodplains.

Jurisdiction/Powers of Department
The Department of the Environment ("department") has general supervisory power, regulation, and control over the natural resources of the State of Maryland within the boundaries of the tidal waters. M.E. C. § 5-503[a]. Policies of the department are carried out through the Water Management Administration. It is State policy to promote public safety and welfare, and control and supervise so far as is feasible, construction, reconstruction, and repair of dams, reservoirs, and other waterworks in any waters of the State of Maryland. The law gives power to the department to issue a permit for construction, reconstruction, or repair of any reservoir, dam, or waterway. An applicant shall agree to allow reasonable inspection of the proposed project site by representatives of the Water Management Administration ("administration"). If the department determines that any reservoir, dam, or similar waterway construction is unsafe, needs repair, or should be removed because it is unsafe and not repairable, the department shall notify the owner in writing to repair or remove the object, as the situation warrants. The repair or removal work shall be completed within a reasonable time. If the work is not completed in the time prescribed in the notice, the department may have the work completed at the owner's expense. The department may bring an action in the proper court to recover this expense. In the event of an emergency in which repairs are necessary to safeguard life and property against predicted immediate danger, these repairs must conform to requirements specified by the administration. The law does not specifically state that the department has power to take over a dam in the event of an emergency.
Liability and Immunity
The owner is responsible for the safety of the dam and shall provide a close watch on the conditions affecting the dam's safety. The owner shall notify the administration of significant changes in condition. COMAR 216.17.04.05E[1][2]. Liability of the state is not explicitly defined in the laws or regulations.

Definitions/Dam Classifications
COMAR defines a dam as any obstruction, wall, or embankment, together with its abutments and appurtenant works, if any, in, along, or across any stream, heretofore or hereafter constructed for the purpose of storing or diverting water or for creating a pool upstream of the dam, as determined by the WMA, State of Maryland. The laws and regulations do not specifically define "dam height." However, "normal depth" is defined as "the maximum vertical distance measured from the original stream bed invert to the normal water surface."

In addition, dams are assigned a structure classification according to the following criteria COMAR 26.17.04-03[B]:

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<tr>
<td>I</td>
<td>20,000 ac-ft or more</td>
<td>50 ft or more</td>
<td>Probable</td>
<td>Serious damage to residential, industrial, or commercial buildings; important public utilities, public roads or RR.</td>
</tr>
<tr>
<td>II</td>
<td>Greater than 1,000 ac-ft and less than 20,000 ac-ft</td>
<td>Greater than 25 ft and less than 50 ft</td>
<td>Small possibility</td>
<td>Located in predominately rural or agricultural areas where failure may cause damage to isolated residence or may cause interruption of use or service of public utilities or roads. Damage is within the financial capability of owner to repair.</td>
</tr>
<tr>
<td>III</td>
<td>Less than 1,000 ac-ft</td>
<td>Less than 25 ft</td>
<td>Very unlikely</td>
<td>Damage is of same magnitude as cost of dam and within financial capability of owner to repair.</td>
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</table>

Classification is defined through the above table in conjunction with a "danger reach" analysis of each dam. After the classification is assigned, the inflow design flood and spillway design can be determined. COMAR 26.17.04[B].

a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Any person or persons and their duly authorized agents, owning, operating, maintaining, or proposing to construct any dam, reservoir, or other obstruction, or to change the course, current, or cross section of any body of water in this State.
f. Person: The federal government, the State, any county, municipal corporation, or other political subdivision of the State, or any of their units, or an individual, receiver, trustee, guardian, executor, administrator, fiduciary, or representative of any kind, or any partnership, firm, association, public or private corporation, or any other entity.
g. Repairs: (a) includes any modification or alteration to a dam, reservoir, waterway
obstruction, stream channel, or floodplain when the:

(i) Hydraulic performance or safety of a dam or waterway obstruction is altered or affected; or

(ii) Hydraulic performance of a bridge or culvert, stream channel, or floodplain is altered or affected; or

(iii) Use of construction equipment within a flowing stream would be required.

(b) Repair does not include ordinary maintenance which does not cause pollution, as defined in COMAR 26.17.01.01B(14), to the waters of the State.

h. Spillway: Not defined.

Program Funding
The rules and laws do not specifically mention program funding.

Fees and Costs
Permit application fees have not been established under the rules or laws.

Permit/Approval Process
Any person who proposes to construct, reconstruct, repair, or alter a dam, reservoir, or waterway obstruction, or change in any manner the course, current, or cross section of a stream or body of water within the State except tidal waters, including any changes to the 100-year frequency floodplain of free-flowing streams shall obtain a permit from the administration before commencing any work. COMAR 26.17.04.03. The application shall include evidence of the benefits to be derived from the project; an environmental study of the significant effects of the project; provisions assuring the maintenance and operation of the proposed project throughout the project’s existence; hydraulic calculations; and project plans including survey and topographic information.

In addition to the requirements set forth in COMAR 26.17.04, the procedure for obtaining a permit for construction, reconstruction, repair, or alteration of a dam or reservoir is established in two steps, which are defined in COMAR 26.17.05. The first step is called the Plan Development Phase. Applicants must receive written approval of the classification of the dam from the administration. Next, the applicant must submit a feasibility report that includes information on the objectives of project, alternate proposals considered, site analysis, safety, estimated costs, benefits to be derived from the project, any environmental impact, and a written assurance by the owner that funds will be available to complete the project as planned and for continued maintenance of the project throughout the life of the structure. The second step is called the Construction Phase. Before a construction permit is issued, a separate permit application is required. Final construction designs and specifications are to be submitted at this time. The administration also requires that the applicant post a construction bond, or similar security, to assure that the project has adequate funding. A time schedule for construction, a maintenance plan, and an operations plan are also to be included in the Construction Phase of the permit application. All work to be done is to be funded by the owner. Applicants must engage a registered professional engineer, in accordance with Maryland State Law, to prepare the designs and specifications, and to provide supervision during construction. Spillway design is to adhere to established procedures deemed acceptable by the administration. Guidelines are found in COMAR 26.17.04-05(4).

Inspection Process
Appendix E

Maryland

The administration shall make inspections of all dams within its jurisdiction. The law does not specify the frequency of these inspections or the costs involved. COMAR 26.17.04.05 (E)(2).

The owner is responsible for the safety of the dam and for the necessary surveillance and inspections. The owner or a representative of the owner shall perform the surveillance. The law does not require inspections to be performed by a licensed professional engineer. COMAR 26.17.04.05 (E)(1).

Right of Entry

Applicants are required to allow representatives of the department the right of entry to facilities under its jurisdiction (COMAR 26.17.04.05 E[2]).

Operation and Maintenance

Although not expressly stated, it appears that under the rules, the owner is responsible for operation and maintenance.

Emergencies/Emergency Action Plan

In the event of an emergency the owner shall immediately make the necessary repairs to safeguard life and property against predicted immediate danger. In these events, the administration shall be notified within 24 hours of the emergency repairs needed and the extent of work underway, if any, and the work shall conform to the requirements as specified by the administration (COMAR 26.17.04.05F).

The laws and regulations do not explicitly state that the owner of an existing dam must have an "Emergency Action Plan." Applicants for a permit are required to submit a "warning plan" for Category I and Category II (high and significant hazard) dams as part of the Construction Phase of the permit application. This plan is to describe the steps to be followed in notifying persons whose lives, property, or health may be endangered by failure, improper operation, or other circumstances affecting the safety of the dam.

The warning plan shall identify the most practical and expedient means for notifying potentially affected persons in close proximity to the dam or property owners (COMAR 26.17.04-.05A[3][b][ix]).

Owner Non-Compliance/Violations/Penalties

If the administration determines that there has been a violation of Environment Article 5-501 through 514, or any regulation or permit, a written complaint shall be served upon the alleged violator. The administration can issue an order for corrective action to be taken. Any person named in the order can request a hearing within 10 days of receipt of the order. COMAR 26.17.04-.12. Upon failure of the owner to comply with requirements of an administrative order, a permit may be modified or suspended. A hearing may be held upon written request of the owner, but the administrative action may not be stayed pending the hearing. The law states that any person who violates the provisions of any administrative order is guilty of a misdemeanor.

Upon conviction, the violator is subject to a fine not exceeding $500 per day for each offense (not to exceed a total fine of $25,000) or imprisonment not exceeding one year, or both, with costs imposed in the discretion of the court.

Recordkeeping

The laws and rules do not specifically address recordkeeping.

Oversight

The permittee has the right to be heard regarding a revocation of permit upon a request in writing not later than 10 days after the date on which the revocation notice is served. The administration
shall schedule a hearing within 10 days from receipt of the request and give a decision within 30 days from the date of the hearing. Hearings would be held by and before the administration.

Miscellaneous
A small pond, except a waste water stabilization pond, which has a contributory drainage area of less than one square mile, is a low hazard structure, and is less than 20 feet in height (measured from the upstream toe to the top of the dam) may be exempt from the permit requirement, but must obtain approval from the Local Soil Conservation District.

a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.

c. Severability
   - The laws and rules do not specifically address severability.

d. Supplemental Reference Material
   - The laws and rules do not specifically address supplemental reference material.
MASSACHUSETTS

Summary

[Pros] The Massachusetts General Laws (M.G.L.) and Code of Massachusetts Regulations (C.M.R.) are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. These rules provide a comprehensive “Definitions” section, a sequential summary of the entire dam construction and modification permitting process, and emphasis on assessing the foreseeable consequences of dam failure and magnitude of flooding resulting from such failure. The C.M.R. sets forth specific design and construction criteria in the following areas: foundations and abutments, construction materials, surveys, hydrologic investigation, spillway design, conduits, seepage control, and structural stability and slope protection. The C.M.R. also provides minimum factors of safety and recommended factors of safety. Under the rules dam owners are responsible for registering, inspecting, reporting inspection results to the Office of Dam Safety and maintaining their dams in good operating condition. The M.G.L. places the responsibility of inspection of dams on owners of dams. Dam owners are required to inspect dams according to the following schedule: high hazard potential dams once every two years, significant hazard potential dams once every five years, and low hazard potential dams once every ten years. Following inspection of any dam, the owner shall file with the commissioner a dam inspection form signed by a registered professional engineer, containing information relative to the present condition, safety and adequacy of the dam and such other information as the commissioner may require by regulation.

[Cons] The rules do not set forth how the Dam Safety Program or the Office of Dam Safety is funded.

Citation and Title

[Statute] Massachusetts dam safety law is contained in Massachusetts General Laws, Chapter 253, Sections 44 through 52.
[Rules/Regulations] Rules and regulations pertaining to Massachusetts dam safety are found in C.M.R. 302 10.00 - 10.17, adopted 4/14/89.
[Administrative Agency] Department of Environmental Management (“department”)

Jurisdiction/Powers of Department

M.G.L. ch. 253, § 45 empowers the commissioner of the department to require from persons constructing dams the submission of periodic construction reports and as-built drawings, and to order the discontinuance of projects if they are found to be not in conformance with plans and specifications. M.G.L. ch. 253 § 46 grants the commissioner the authority to inspect and order the inspection of dams. Powers listed under M.G.L. ch. 253 § 47 include the power to order owners to take corrective action in the case of an unsafe dam, and the power to act in a dam emergency. M.G.L. ch. 253 § 48 allows the commissioner to order that costs incurred by the State under the proceedings of §§ 45-47 be paid by the owner.

Regulations promulgated under the State dam safety program provide further authorizations: 1) The department is authorized to supervise the construction, alteration, repair, removal, enlargement, and emergency action plans of jurisdictional dams in Massachusetts (302 C.M.R. 10.02); 2) The commissioner or his designee is authorized to enter upon private property at any time to investigate or inspect any dam (302 C.M.R. 10.10); 3) The commissioner has the power to issue a permit to impound water, adopt rules and regulations, call for remedial work, and cite non-compliance. 302 C.M.R. 10.11.
Liability and Immunity
Under M.G.L. ch. 253 § 49, "No order, approval, request, or advice of the commissioner shall impair the legal duties and obligations of the owners of reservoirs, reservoir dams, or milldams, or their liability for the consequences of their illegal acts or of the neglect or mismanagement of their servants or agents."
In addition, 302 C.M.R. 10.16 addresses State liability in the following way: "Any State employee charged with the enforcement of the Dam Safety Act and these Rules, acting in good faith and without malice, in the discharge of these duties, shall not thereby be personally liable for any damage that may accrue to persons or property as a result of any act or by reason of any act or omission in the discharge of those duties." The regulations do not relieve from responsibility any person owning or operating a dam from any damages to persons or property caused by defects, and the commissioner may not be held liable by reason of inspections or permits issued. The owner of a dam shall be responsible for liability for damage to property of others or injury to persons, including but not limited to loss of life, resulting from the operation, failure of or mis-operation of a dam. Nothing in the statute shall relieve or lessen the responsibility of any person owning, or operating a dam from any damages to persons or property caused by dam defects, nor shall the commissioner be held liable by reason of the inspections required or permits issued. M.G.L. ch. 253, § 48B.

Definitions/Dam Classifications
M.G.L. c. 253 s. 44 defines the term dam as any artificial barrier, including appurtenant works, which impounds or diverts water, and which is: (1) 25 ft or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation; or (2) has an impounding capacity at maximum water storage elevation of fifty acre-feet or more. Any other artificial barrier, including appurtenant works, the breaching of which could endanger property or safety, may be designated by the commissioner as a dam, and shall be subject to sections 44 to 50, inclusive. Dam Height is defined as the vertical distance from the lowest elevation of the dam crest to the lowest point of natural ground, including any stream channel, along the downstream toe of the dam.

<table>
<thead>
<tr>
<th>Hazard Classification</th>
<th>Hazard Potential</th>
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<tbody>
<tr>
<td>High Hazard (Class I)</td>
<td>Failure will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads.</td>
</tr>
<tr>
<td>Significant Hazard</td>
<td>Failure may cause loss of life and damage to homes, industrial or commercial facilities, secondary highways or interruption of use or service of relatively important facilities.</td>
</tr>
<tr>
<td>Low Hazard (Class III)</td>
<td>Failure may cause minimal property damage to others. Loss of life is not expected.</td>
</tr>
</tbody>
</table>

An owner may at any time request the commissioner to reconsider the hazard determination. A registered professional civil engineer must file the owner’s request and include the findings and analyses with which the owner disagrees. The commissioner will issue a written decision to the owner and the registered professional civil engineer within 30 days of receipt for hazard reconsideration, and such decision shall be final and binding upon the parties. 302 C.M.R. 10.06.

a. Abandonment: Not defined.
b. **Engineer:** [Registered Professional Engineer] A civil engineer licensed and registered in the Commonwealth of Massachusetts with experience in dam safety inspections and engineering. Individuals licensed and registered in another state, but not in Massachusetts must be approved by the Commissioner.

c. **Hazard Potential:** The rating for a dam based on the potential consequences of failure. The rating is based on potential for loss of life and damage to property that failure of that dam could cause downstream of the dam. The hazard potential classification for a dam also is based on the incremental adverse consequences of failure, and has no relationship to the current structural integrity, operational status, flood routing capability, or safety condition of the dam or its appurtenances.

d. **Operator:** Not defined.

e. **Owner:** The person or persons, including any individual, firm, partnership, association, syndicate, company, trust corporation, municipality, agency, political or administrative subdivision of the commonwealth or any other legal entity of any kind holding legal title to a dam, but excluding the United States, its agencies or any person who operates a dam owned by the United States.

f. **Person:** Not defined.

g. **Repairs:** Any work done at a dam which affects the integrity of the dam. This includes but is not limited to, work requiring excavation into the embankment fill or foundation of a dam or work requiring removal or replacement of major structural components of a dam.

h. **Spillway:** A structure over or through which flood flows are discharged. If the flow is controlled by gates, it is a controlled spillway; if the elevation of the spillway crest is the only control, it is an uncontrolled spillway.

**Program Funding**
The laws and rules do not address program funding.

**Fees and Costs**
Registration Fees:
(a) The fee for registering a dam with the Office of Dam Safety for the first time is $75.00.
(b) The fee for registering with the Office of Dam Safety the transfer of a dam to a new dam owner after a real estate transaction is $50.00.

Chapter 253 Application Fee and Permit Fees.
(a) The fee to apply for a Chapter 253 Dam Safety Permit to construct, materially alter, perform major repairs, breach or remove a dam is $50.00.
(b) The fee for review and issuance of a Chapter 253 Dam Safety Permit is based on the size and cost of the proposed project as follows
- For a dam construction project costing up to $100,000 the fee will be $250.00.
- For a dam construction project costing between $100,000 and $500,000, the fee will be $500.00.
- For a dam construction project costing between $500,000 and $1,000,000, the fee will be $750.00.
- For any dam project over $1,000,000, the fee will be $1,000.00.

The fee for a dam safety emergency inspection of unsafe non-compliance dams performed by the Department, will be up to $1,000.00.
Appendix E 104 Massachusetts
Permit/Approval Process
Under M.G.L. ch. 253, § 45A, no person shall construct or materially alter a dam without applying for and receiving permit approval from the department. Permit applications must be accompanied by plans, specifications, and other documents in accordance with DCR’s standard design and construction criteria. A registered professional civil engineer must certify the documents and also supervise construction.

The owner must first file a Preliminary Report. The Preliminary Report shall include: (1) completion of all required information on the application; (2) maps showing the location of the proposed structure that include the county, location of state roads, access to site, and outline of the reservoir; (3) preliminary drawings or sketches that include cross sections, plans and profiles of the dam, propose pool levels, and type of all spillways; (4) preliminary design criteria; (5) book and page number of location of the dam as recorded in The Registry of Deeds with the name of the Registry. The owner must also file a Final Design Report. The Final Design Report shall include: (1) a report of the investigation of the foundation soils or bedrock and the borrow materials, including the location of borrow areas, that are to be used to construct repair the dam; (2) analysis and/or criteria to indicate that the dam will be stable during the construction and filing and under all conditions of reservoir operations; (3) computations indicating that the dam is safe against overtopping during occurrence of the inflow design flood and wave action; (4) criteria, design data or references to indicate that seepage flow through the embankment, foundation, and abutments will be controlled to limit internal erosion and sloughing in the area where the seepage occurs; (5) calculations and assumptions relative to design of the spillway; (6) provisions to protect the upstream slope, crest, and downstream slope of earth embankments and abutments from erosion due to wind and rain; (7) other design data pertinent to dam and site conditions; (8) a proposed construction schedule; (9) a proposed filling schedule for the reservoir; (10) a maintenance and operation plan; and (11) for all new high and significant hazard potential dams, an emergency action plan. The Preliminary Report and Final Design Report may be submitted as one document. The commissioner shall approve or deny the permit application within 60 days of the date he receives the Preliminary Report and the Final Design Report. 302 C.M.R. 10.09.

The engineer must certify, upon completion, that the dam was constructed in accordance with the permit. The regulations specify that construction must be commenced within 2 years of the issuance of the permit. 302 C.M.R. 10.14. 302 C.M.R. 10.17, includes instructions on the application procedure as well as requirements for certain dam design standards to follow (including spillway criteria). No filing fees are assessed by the State for this process.

Inspection Process
[State] After receiving the owner’s inspection form, the commissioner shall determine whether the dam and appurtenant features meet accepted dam safety standards. A Certificate of Non-compliance shall be issued if the commissioner determines that the dam or appurtenant features are unsafe, as defined under 302 C.M.R. 10.06. 302 C.M.R. 10.08. The commissioner may order the owner of the dam to (1) alter, repair or removal the dam or draw down the impounded water, or (2) order the thorough evaluation of the dam by a registered professional civil engineer. The commissioner shall record notice of such order in the registry of deeds in the county where the dam lies. The cost of such recording may be assessed against the owner. M.G.L. ch. 253, § 46.

[Owner] The owner shall periodically inspect all dams in accordance with the following schedule:
### Hazard Potential Inspection Frequency

<table>
<thead>
<tr>
<th>Potential</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>Ten years</td>
</tr>
<tr>
<td>Significant</td>
<td>Five years</td>
</tr>
<tr>
<td>High</td>
<td>Two years</td>
</tr>
</tbody>
</table>

In addition, high and significant hazard potential dams whose condition are determined to be poor and/or emergency by formal inspection must be inspected and reported on at least every six months by a registered professional engineer employed by the owner until the dam safety repairs are completed and the dam is found to be in satisfactory condition.

The owner of any dam shall file with the commissioner, a dam inspection form containing information relative to the present condition, safety and adequacy of the dam and such other information as the commissioner may require by regulation. A registered professional civil engineer must sign the dam inspection form.

### Right of Entry

During construction, the commissioner or his designee may enter upon the property to inspect without prior notice. 302 C.M.R. 10.09.

### Operation and Maintenance

Routine maintenance-related work does not require a Chapter 253 Dam Safety Permit.

### Emergencies/Emergency Action Plans

M.G.L. ch. 253 § 47 cites powers of the department to take corrective action to abate a threat to safety and property. C.M.R. 10.14 provides that the owners of all dams classified or reclassified as high hazard must provide an Emergency Action Plan. The owner of any other dam regardless of the hazard rating may also be required to prepare and EAP if deemed necessary by the commissioner. Owners shall update the plans annually. The EAP shall, at a minimum, include:

1. (a) the identification of equipment, manpower and material available for implementation of the plan;
2. (b) a notification procedure for informing the local emergency agencies;
3. (c) a dam failure inundation map for high hazard potential dams and a topographic map for significant hazard potential dams showing the stream which will be flooded; and
4. (d) a procedure for warning nearby local residents if failure of the dam is imminent and a listing of addresses and telephone numbers of downstream residents who may be affected by the failure of the dam. 302 C.M.R. 10.11.

Prior to submission of the EAP, the owner shall submit a copy to local and State emergency agencies for review. Annually, the owner shall review the EAP, update it, and provide the updated EAP to all involved agencies for review.

### Owner Non-Compliance/Violations/Penalties

If the owner of a dam fails to take corrective action or fails to file an evaluation report, with the time specified in an order, or if the owner of a dam cannot be determined, the commissioner may take such action as he deems necessary to repair or mitigate the unsafe condition. C.M.R. 10.11, states that if the commissioner determines that a dam does not meet the safety standards a certificate of non-compliance may be issued. After a certificate is issued, the dam will be re inspected and the necessary remedial work will be outlined for the owner along with a completion timetable. If the outlined conditions are not met, the commissioner shall enforce emergency actions provided by M.G.L. c.253, § 47. No fines are cited in the laws or rules.
Recordkeeping
During each fiscal year, the department of environmental management shall prepare a report on the overall effectiveness of the dam inspection and regulation program under M.G.L. ch. 253, §§ 44-4; inclusive, including but not limited to, the number of inspections conducted per year, a listing of identified deficient dams in the commonwealth and steps taken to remedy deficiencies. The department shall submit the report to the joint committee on natural resources and agriculture and to the senate and house committees on ways and means, and shall make it available to all interested parties. M.G.L. ch. 253, § 48A.

Under M.G.L. ch. 253, § 45, the owner of any dam shall file a dam registration form with the commissioner before July 1, 2003, and before operating any dam constructed thereafter. The registration form shall contain the name of the owner, the location and the dimensions of the dam and such other information as the commissioner may require by regulation. The registered owner of any dam shall notify the commissioner of the transfer of legal title of the dam and any of changes for which the department may require notice by regulation, not later than 10 days after the date of such transfer or change. The department shall issue a certificate of registration to each dam owner.

Upon request by the commissioner, an owner shall make available for inspection and review, all plans, specifications and other such pertinent material relating to the dam. 302 C.M.R. 10.12.

Oversight
Oversight is addressed in other sections.

Miscellaneous
The State has a dam registration program, which is described in 302 C.M.R.10.00.

Private dam owners must file a dam registration form with the commissioner, and pay a (non-specified) fee, and upon approval of the form shall receive a certificate of registration for their dam.

a. Complaints to Unsafe Conditions
- The laws and rules do not specifically address complaints to unsafe condition.

b. Environmental Impact
- The laws and rules do not specifically address environmental impact.

c. Severability
- The laws and rules do not specifically address severability.

d. Supplemental Reference Materials
- The laws and rules do not specifically address supplemental reference materials.
Summary
[Pros] The Michigan Compiled Laws (M.C.L.) and Michigan Administrative Code (M.A.C.) are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. These rules provide a comprehensive “Definitions” section and a sequential summary of the entire dam permitting process and what information applicants must include in a permit application. The M.C.L. places the responsibility of inspection of dams on owners of dams. The M.A.C. promulgates a very specific inspection schedule wherein the department compiles an alphabetical listing of dams in each hazard potential classification of high, significant, and low. For high hazard potential dams, every third dam in the alphabetical listing of these dams shall be inspected each year as follows: (i) the first, fourth, seventh, tenth, and so on dam in the alphabetical listing will be due for inspection the first year; (ii) the second, fifth, eighth, eleventh, and so on dam in the alphabetical listing will be due for inspection the second year; and (iii) the third, sixth, ninth, twelfth and so on dam in the alphabetical listing will be due for inspection in the third year. The cycle shall be completed every 3 years. For significant hazard potential dams, every fourth dam in the alphabetical listing of these dams shall be inspected each year. The cycle shall be repeated every 4 years. For low hazard potential dams, every fifth dam in the alphabetical listing of these dams shall be inspected each year. The cycle shall be repeated every 5 years. M.A.C. 281.1309. Under the M.C.L., the owner shall file an inspection report prepared by a licensed professional engineer. The M.A.C. establishes a comprehensive list of what information the dam owner inspection reports must include. M.A.C. 281.1310. Under the M.C.L., permit applications shall be accompanied by appropriate fees, which are deposited with the state treasurer for deposit in the land and water management permit fee fund. [Cons] Neither the M.C.L. nor the M.A.C. mentions program funding.

Citation and Title
[Statute] Laws regarding Michigan dam safety are found in Part 315, Dam Safety, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended. [Rules/Regulations] The rules are found in Michigan Administrative Code (M.A.C.) Department of Environmental Quality, Land and Water Management 281.1301. [Administrative Agency] Department of Environmental Quality

Jurisdiction/Powers of Department
The Department of Natural Resources is responsible for the safety of dams in Michigan. The department has the power to regulate the construction, reconstruction, repair, alteration, removal, abandonment, and operation of dams; to provide for the inspection of dams; to provide for the protection of natural resources and the public trust; and to prescribe remedies and penalties. (Part 315, 1994 PA 451). In an emergency, the department may order an owner to repair, drawdown, breach or cease operation to protect public safety, natural resources and the public trust. M.C.L. § 324.31521. If the owner fails to comply, the department may undertake immediate action and may recover from the owner the costs incurred in a civil action commenced in a court of competent jurisdiction. The department may limit dam operation or order dam removal in order to protect public health, safety, welfare, natural resources and the public trust. The department may promulgate rules to establish minor project categories for the alterations and repairs that have minimal effect on the structural integrity of a dam. M.C.L. § 324.31513.
Liability and Immunity
This act shall not be construed to relieve an owner of any legal duty, obligation, or liability incident to the ownership or operation of a dam or impoundment. M.C.L. § 324.31529. A State Supreme Court ruling provides a level of liability to State employees.

Definitions/Dam Classifications
_Dam_ means an artificial barrier, including dikes, embankments, and appurtenant works, that impounds, diverts, or is designed to impound or divert water, or water and any other liquid or material in the water, and that is or will, when complete, be 6 feet or more in height, and has or will have an impounding capacity at design flood elevation of 5 surface acres or more.
_Dam height_ means the difference in elevation measured vertically between the natural bed of a stream or watercourse at the downstream toe of the dam, or, if it is not across a stream channel or watercourse, from the lowest elevation of the downstream toe of the dam to the design flood elevation or to the lowest point of the top of the dam, whichever is less. M.C.L. § 324.31503.

[Hazard Classification]
*High Hazard Potential:* Failure may cause serious damage to inhabited homes, agricultural buildings, campgrounds, recreational facilities, industrial or commercial buildings, public utilities, main highways or class I carrier railroads, or where environmental degradation would be significant, or where danger to individuals exists with the potential for loss of life. M.C.L. § 324.31503.
*Significant Hazard:* Failure may cause damage limited to isolated inhabited homes, agricultural buildings, structures, secondary highways, short line railroads, or public utilities, where environmental degradation may be significant, or where and danger to individuals exists. M.C.L. § 324.32505.
*Low Hazard:* Failure may cause damage limited to agriculture, uninhabited buildings, township or county roads, where environmental degradation would be minimal, and danger to individuals is slight or nonexistent. M.C.L. § 324.31504.

- **Abandonment:** An affirmative act on the part of an owner to discontinue maintenance or operation of a dam.
- **Engineer:** Not defined.
- **Hazard Potential:** A reference to the potential loss of life, property damage, and environmental damage in the area downstream of a dam in the event of failure of the dam or appurtenant works.
- **Operator:** Not defined.
- **Owner:** A person who owns, leases, controls, operates, maintains, manages, or proposes to construct a dam.
- **Person:** Not defined.
- **Repairs:** To substantially restore a dam to its original condition and includes only such restoration as may directly affect the structural integrity of the dam.
- **Spillway:** A waterway in or about a dam designed for the discharge of water.

Program Funding
The laws and rules do not specifically mention program funding.

Fees and Costs
The appropriate fees shall accompany permit applications, according to the following schedule:
*New construction, reconstruction, and enlargement projects:*

- Height > 6 feet but < 10 feet $500
Height > 10 feet but < 20 feet $1000
Height > 20 feet $3000
Repair, alteration, removal and abandonment projects:
Major Projects $200
Minor Projects $100

The department shall forward fees collected to the State Treasurer for deposit in the land and water management permit fee fund.

**Permit/Approval Process**

A person shall not construct, enlarge, repair, reconstruct, alter, remove, or abandon any dam without first applying to the department for a permit and providing information that the department determines necessary for the issuance of a permit. M.C.L. § 324.31509.

A licensed professional engineer shall prepare all plans and specifications, except for minor projects. M.C.L. § 324.31508.

Upon receipt of an application for a permit, the department shall submit copies of the application accompanied by a statement indicating that the department may act upon the application without a public hearing unless a written request is filed within 20 days. Copies shall be submitted to the local unit of government, adjacent riparian owners, any person considered appropriate by the department, any person who requests copies, and, if necessary, a watershed council. M.C.L. § 324.31511. The department shall review an application for a permit in a 2-step process. The first step shall be a review of the conceptual plans to determine if the proposed project may have a significant adverse effect on public health, safety, welfare, property, or natural resources or the public trust in those natural resources. The second step shall be the review of plans and specifications to determine if the engineering design is acceptable. M.A.C. 281.1302. The department shall accept or reject the permit within 60 days, or 120 days if a public hearing is held. M.C.L. § 324.31512. Required spillway design criteria are found in M.C.L. § 324.31516.

A permit issued by the department shall require that the department approve plans and specifications before construction begins. The department shall approve or reject complete plans and specifications within 60 days after their receipt. The permitted activity shall be completed within 2 years after the date of issuance of the permit. M.C.L. § 324.31515.

Within 10 days of completion of the permitted activity, the owner shall file notify the department of its completion. Within 20 days after submitting the notice of completion, the owner shall file as-built plans and a statement signed by a licensed professional engineer certifying that the project was constructed in conformance with the plans and specifications approved by the department. The department shall inspect the project and shall provide the owner with written notice of final approval if the project is determined to have been completed in accordance with approved plans. If the department determines that the project was not competed in accordance with approved plans, the department shall provide notice as to the specific reasons the department considers the project not to be completed in accordance with those plans. M.C.L. § 324.31517.

See also M.A.C. R 281.1302 [Permit applications and procedures], 281.1303 [Permit conditions], 281.1304 [Project assessment], and 281.1305 [Engineering plans and specifications].

**Inspection Process**

[State] The department shall determine the hazard potential classification of all dams, establish an inspection schedule and notify all owners in writing when inspection reports are due. Instead of engaging a professional engineer, a local unit of government that owns a dam may request the department to do a visual inspection of the dam and prepare a report.

[Owner] An owner shall submit to the department inspection reports that are prepared by a licensed professional engineer which evaluate the condition of the dam. The inspection reports shall be submitted as follows:

- Once every 3 years for high hazard potential dams
• Once every 4 years for significant hazard potential dams
• Once every 5 years for low hazard potential dams
At a minimum, the inspection report shall include: (a) an evaluation of the dam’s condition, spillway capacity, operational adequacy, and structural integrity; (b) a determination of whether deficiencies exist that could lead to the failure of the dam; (c) recommendations for maintenance, repair, and alterations of a dam as are necessary to eliminate any deficiencies. M.C.L. §324.31518.
The owner or his/her agent shall advise the department and the affected off-site public authorities and safety agencies of any sudden or unprecedented flood or unusual or alarming circumstance or occurrence existing or anticipated that may affect the safety of the dam within 24 hours of the flood, circumstance, or occurrence. M.C.L. § 324.31520.

Right of Entry
The department may enter in or upon any private or public property anytime where the public safety may be in danger and at all reasonable times, after attempting to contact the owner before entering the site and having shown proper identification, for the purpose of inspecting or investigating conditions related to the construction, operation, or safety of a dam, and for the purpose of determining compliance with the terms, conditions and requirements of a permit. M.C.L. § 324.31527.

Operation and Maintenance
Operation and maintenance is discussed throughout other sections.

Emergencies/Emergency Action Plans
Owners of high and significant hazard potential dams are required to have an emergency action plan submitted to the department and to the local emergency services coordinator. M.C.L. § 324.31523.

Owner Non-Compliance/Violations/Penalties
If the department determines that a person is in violation of this part or a condition set forth in a permit issued by the department, the department may issue an order requiring the person to comply with the conditions or to restore the site affected by the violations as nearly as practicable to its original condition. M.C.L. § 324.31524. An order shall state the nature of the violation the required remedial action and shall specify a time for compliance that the department determines is reasonable.

Recordkeeping
The laws and rules do not specifically address recordkeeping.

Oversight
Any person aggrieved by any action or inaction may request a hearing of the matters involved. The department shall conduct the hearing in accordance with the Administrative Procedures Act of 1969. M.C.L. § 324.31526.

Miscellaneous
The Dam Safety Act also authorized enforcement of inspection report recommendations, exempts dams under federal jurisdiction, and requires promulgation of administrative rules, including rules to establish minor project categories.
A permit to construct a new dam or reconstruct a failed dam may require a performance bond. The performance bond shall be secured and documentation shall be submitted to the department before the commencement of construction. The bond, instrument, mechanism, or fund or
combination of these methods of assurance shall be in the amount equal to a reasonable estimate of the cost, adjusted for inflation, that is required to adequately complete a project or remove a completed or partially completed dam and to provide for complete or partial restoration of a project site. M.A.C. R 281.1307.

a. Complaints to Unsafe Conditions
   - The laws and rules do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - The laws and rules do not specifically address environmental impact.

c. Severability
   - The laws and rules do not specifically address severability.

d. Supplemental Reference Materials
   - The laws and rules do not specifically address supplemental reference materials.
MINNESOTA

Summary
[Pros] The Minnesota Statutes (Minn. Stat.) and the Minnesota Administrative Code (Minn. R.) provide a sequential summary of the permit application process and what shall be filed with the application. The rules set forth specific design requirements as well as “plans and specifications” criteria, work inspection and construction reports standards, and as-built plans and data requirements.
[Cons] When compared to other states, the Minnesota laws and rules are not organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. These rules provide a limited “Definitions” section. The laws and rules do not explicitly require the owner of a dam to make regular inspections of his/her dam, but rather the rules require the commissioner to make regular inspections of all dams. In addition, the laws and rules do not address the issue of abandonment.

Citation and Title
[Statute] Minnesota’s Dam Safety Law is contained in Minnesota Statutes Chapter 103G, Waters of the State, Dam Construction and Maintenance
[Rules/Regulations] Rules pertaining to Dam Safety Laws are found in Minnesota Administrative Code Chapter 6115 Public Water Resources
[Administrative Agency] Department of Natural Resources

Jurisdiction/Powers of Department – see Minn. Stat. § 103G.511.
The law states that the Department of Natural Resources (“department”) supervises the safety of dams and reservoirs as part of its overall supervision of water conservation. The commissioner of the department sets forth minimum standards and criteria for dam classification and identification of hazards to health, safety, and welfare. The law gives the commissioner the authority to approve or deny permits for dam projects for water and waste impoundment, to promulgate rules, and to inspect any dam as is deemed necessary. The commissioner must be granted access to a dam at any reasonable time to conduct inspections. The commissioner may order additional engineering studies necessary to complete the investigation at the owner's expense and an inspection report shall be filed so the final decision can be made in order to call for repairs or removal.
The law states that the commissioner can impose requirements to ensure that a dam owner is financially capable of maintaining, repairing, or removing the dam if needed.
The Minnesota law contains a separate section on powers of the commissioner concerning State-owned or local government unit-owned dams. Minn. Stat. § 103G.505. It gives the commissioner power to construct, maintain, and operate dams necessary to maintain such uniform water levels as may be established under the law. The law goes on to facilitate the repair and restoration of State-owned dams. It also gives authority to the commissioner to assist local government units in financing the repair of their dams through matching grants. The process whereby the locality can receive the grant is within the law. Additionally, a loan program is established in the law to partially finance the local unit’s portion of the repair costs. The commissioner also has the authority to take over a locally owned dam if the locality fails to repair or remove as ordered by the commissioner. The commissioner in an emergency may take any steps necessary to protect life and property. The commissioner shall make an annual report to the Legislature on the status of dams owned by the State or local governmental units. The report shall include recommendations for action including any requests for State share or matching funds for grants-in-aid to local governments. Minn. R. 6115.0400.
The commissioner may acquire lands or any necessary interest in lands by purchase, gift, or condemnation. The commissioner must direct maintenance of dams owned by the State or built on property owned or controlled by the State. The commissioner may accept funds from local governmental and civic agencies or persons to acquire property for or to construct, maintain, or operate dams and control structures. Minn. Stat. § 103G.505.

**Liability and Immunity**
Nothing in the rules shall be construed to relieve the owner of a dam or permittee of the legal duties, obligations, or liabilities incident to the ownership or operation of the dam.

**Definitions/Dam Classifications**
*Dam* means any artificial barrier, together with appurtenant works, which does or may impound water and or waste material containing water. Dams exempt from State jurisdiction include those less than 25 feet in height or with a storage capacity of less than 50 acre-feet, not in excess of 6 feet in height regardless of storage or more than 15 acre-feet regardless of height. Other dams that are exempt include those that are for containment of sewage, federal dams, and flood control dams. If dams smaller than the size requirement pose a potential threat to life, then they are considered jurisdictional.

*Dam height* means the vertical distance from the natural bed of the stream or watercourse measured at the downstream toe of the dam or from the lowest elevation of the outside limit of the dam, of it is not across a stream channel or watercourse, the maximum storage elevation (MCAR 6, 1.5030).

**Hazard Classification**
The commissioner shall classify all existing dams. Minn. R. 6115.0340.

*Class I* - any loss of life of serious hazard or damage to health, main highways, high-value industrial or commercial properties, major public utilities or serious direct or indirect economic loss

*Class II* - possible health hazard or probable loss of high-value property, damage to secondary highways, railroads or other public utilities or limited direct or indirect economic loss to the public other than described in Class III

*Class III* - property losses restricted mainly to rural buildings and local county and township roads, which are an essential part of the rural transportation system serving the area, involved

a. **Abandonment**: Not defined.
b. **Engineer**: Not defined.
c. **Hazard Potential**: Not defined.
d. **Operator**: Not defined.
e. **Owner**: The owner or lessee of the property to which the dam is attached, unless the dam is sponsored by a governmental agency which will be responsible for operation and maintenance of the dam, in which case that sponsoring agency shall be considered the owner.
f. **Person**: Not defined.
g. **Repairs**: Any work which will change the hydraulic capacity of the structure or entail any changes in the structural character of the dam.
h. **Spillway**: Not defined.

**Program Funding**
The laws and rules do not specifically mention program funding.
Fees and Costs
Each application for a permit must include a $15 filing fee. The check is made payable to the Commissioner of Finance.

Permit/Approval Process
Before commencing with alterations, repairs or removal of a dam, the owner shall make a separate application for each existing dam proposed to be changed upon forms provided by the commissioner. The application shall include: (a) name and address of owner(s); (b) proposed changes; (c) maps, plans, and specifications which set forth pertinent details including location, type, dimensions, and storage capacity; and (d) proposed date of start and completion of construction. As to removal, after removal, the owner shall submit evidence as to the manner in which the work was performed and the conditions obtained after the removal. The commissioner shall inspect to determine that a sufficient portion of the dam has been removed to eliminate the hazard directly attributable to the presence of the dam. Minn. R. 6115.0350.

The owner shall not transfer the ownership of any Class I or II dam without a permit from the commissioner.

A separate application, including a preliminary report for each new dam or enlargement of an existing dam, shall be filed with the commissioner upon forms provided by the commissioner. Minn. R. 6115.0410.

Inspection Process
[State]
Under the law, the commissioner shall make an initial detailed systematic technical inspection and evaluations of every Class I, II, or III dam in order to assess the general safety condition. Minn. R. 6115.0360. The inspection shall include a review and analysis of available data on the design, construction and operation; a visual inspection of the dam and downstream and upstream areas; an examination of significant structural, geotechnical, hydraulic, and hydrologic features including, where applicable, electrical and mechanical equipment for the operation of control facilities; evidence of leakage, erosion, seepage, slope instability, undue settlement, displacement, tilting, cracking, deterioration, and improper functioning of drains and relief wells; adequacy and quality of maintenance and operating equipment and procedures; a report on general condition including, when possible, an assessment of storage capacity, hydraulic and hydrologic capabilities, structural stabilities, and any other condition including, when possible, an assessment of storage capacity, hydraulic and hydrologic capabilities, structural stabilities, and any other conditions which constitute a hazard based upon current design considering the size and hazard class of the dam. After the initial detailed inspection, the commissioner shall make periodic inspections, specifically: Class I dams at least one time every year; Class II dams at least one time every four years; Class III dams at least one time every eight years. Upon completion of each inspection, the commissioner shall notify the owner of the dam, in writing, of the results of the inspection and if the dam needs corrective action, the commissioner shall order such action. Minn. R. 6115.0360.

The law gives the commissioner the authority to inspect all jurisdictional dams during construction and during regular operation. Additionally, a hazard classification inspection must be completed on all dams. Minn. Stat. § 105.52.

[Owner] The rules do not provide a clear explanation of any dam owner’s inspection responsibilities.

Right of Entry
The rules set forth that owners shall allow the commissioner prompt access to and inspection of all records, plants, structures, facilities, and operation at all reasonable times. Entry is subject to
reasonable compliance with the owner’s safety rules and avoidance of unreasonable impairment of or interference with construction and operation. Minn. R. 6115.0450.

**Operation and Maintenance**
The law states that the owner has responsibility for the maintenance, repair, and liability of his structure. The owner shall operate and maintain the dam. Regulation of maintenance and operation for public health, safety, and welfare is vested with the commissioner. Minn. R. 6115.0380.

**Emergencies/Emergency Action Plans**
The rules require owners of Class I dams to file a contingency plan for notifying any person whose lives, property, or health may be endangered by failure, mis-operation, or other circumstances or occurrences affecting the dam. The contingency plan should identify the most practical and expeditious means for warning considering the time factor involved based on the proximity of the dam to affected parties. Minn. R. 6115.0490. If there is no feasible or practical means to provide for adequate evacuation warning in sufficient time if a catastrophe occurs the owner shall be responsible for notifying affected downstream property owners of that fact.

**Owner Non-Compliance/Violations/Penalties**
The permittee may be held for claims of violations of any terms or conditions of the permit by the State or any other persons. The commissioner may revoke a permit if the owner is in violation of these laws or the violator could be convicted of a misdemeanor. Minn. Stat. § 105.541. No fines for violations are mentioned.

**Recordkeeping**
The rules require the owner to keep inspection schedules and performance reports may have to be submitted annually. Owners may be required to keep records and report on maintenance, operation, staffing, and engineering and geologic investigations and any other data necessary to protect the public health, safety, and welfare. Minn. R. 6115.0380.

**Oversight**
The rules state that nothing in these rules shall be construed to deprive any owner of such recourse in the courts. Minn. R. 6115.0440.

**Miscellaneous**
1. Citations for small dam design criteria are separate from the regular rules.
2. The statutes include language on transfers of ownership of dams and the approval process for this.
3. The dam safety statutes are included in the laws concerning water conservation--there is a strong emphasis on the environment and environmental impacts throughout the law.
4. Where activities authorized by a permit involve the rights or interests of any other person, the permittee shall acquire all necessary interests or permissions, including paying the costs of the alteration, relocation, or replacement of any publicly owned facility. Minn. R. 6115.0470.
   a. **Complaints to Unsafe Conditions**  
      - The law and rules do not specifically address complaints to unsafe conditions.
   b. **Environmental Impact**  
      - The law and rules do not specifically address environmental impact.
   c. **Severability**  
      - The law and rules do not specifically address severability.
d. **Supplemental Reference Materials**
- The law and rules do not specifically address supplemental reference material.
MISSISSIPPI

Summary
[Pros] State dam safety statutes and laws may be applied to otherwise exempt dams or reservoirs if the State determines regulation of such structures is in the best interests of public safety. Persons intending to acquire the right to store or use water from a reservoir formed by a dam must first be authorized by the Commission. Dams and reservoirs may be exempt from State inspections if the Commission determines that the location, size, or condition is such that lives and property will not be endangered. The Commission is authorized to seek consultation from other agencies or consultants; any recommendations provided by these entities may be imposed upon dam owners. Dams or reservoirs may not be constructed to impair the water rights of others; the Commission may determine minimum water flow rates necessary to protect downstream users. The Permit Board may report noncompliant owners and operators to the Commission. That Commission may assess fines and/or file a civil or criminal complaint. [Cons] No mention of filing fees. The numerous State agencies involved with dam safety administration may complicate the process.

Citation and Title

Jurisdiction/Powers of Department
There are three administrative agencies with the responsibility to enforce dam safety statutes and regulations of the State. The agencies include the Mississippi Commission on Environmental Quality (“Commission”), the Mississippi Department of Environmental Quality (“MDEQ” or “Department”), and the Mississippi Environmental Quality Permit Board (“Permit Board” or “Board”).
The Permit Board is authorized to contract with other agencies or consultants to prevent the pollution of State waters and to protect the safety and general welfare of the people. Recommendations from these entities may be imposed before authorization of any dam or reservoir construction or modification. M.C.A. § 51-3-39. The Board is authorized to place special conditions on any authorization to construct or modify a dam. LW-4(V)(G). The Commission may order the removal of a dam after it has been constructed or modified when it is determined that the dam does not meet criteria and/or standards established by the Board or Commission and/or otherwise fails to adequately protect lives and property. M.C.A. § 51-3-39(5), LW-4(V)(H), LW-4(VI)(D).
The Board and Commission are authorized to expend available State funds and to receive funds from federal agencies. MCA § 51-3-39(3).
It shall be the duty of the Commission on Natural Resources to serve as the enforcement agency for the Permit Board when the board determines that the sanctions available to it are not sufficient to achieve compliance with the provisions of this chapter. The Board shall notify the Commission on Natural Resources of such noncompliance or violations and request that the agency take appropriate action. M.C.A. § 51-3-55(1). The agency may file a criminal complaint. In lieu of filing a criminal complaint, the Commission may impose a civil penalty not more than $25,000.00 for each such offense, such penalty to be assessed and levied by the agency after a hearing as provided in M.C.A. § 51-3-55.
Liability and Immunity
The provisions of this section shall not be construed as creating any liability for damages against the State and/or against its officers, agents, or employees. M.C.A. § 51-3-39. The law does not specifically address the liability of dam owners, but the State’s general liability law says the owner is liable because if the dam were not there, no hazard would exist. The Board’s receipt, comment or approval of any design construction, or modification does not relieve the dam owner, consulting engineer, consulting Geologist, contractor, equipment supplier, attorney, or any other party of any liabilities or responsibilities. LW-4 (II)(C). Commission approval of or comment on any document does not establish or convey any liability or responsibility to the Commission, nor does such represent any assurances that the project will be able to comply with any authorization requirements or otherwise perform as intended by the owner, consulting engineer, contractor, equipment supplier, attorney, or other parties. The dam owner is responsible for complying with all conditions of construction, operation, and maintenance activities achieve such compliance.

The regulations set forth that the dam owner and/or any person responsible for the construction and/or operation of a dam or reservoir assume all risks associated with designing and constructing the dam to meet less than the most stringent design criteria for high-hazard dams, including the risk of having to make modifications to the dam to meet future heightened regulatory requirements associated with a change in classification.

Definitions/Dam Classifications
Dam is any man-made barrier or obstruction, together with appurtenant works, if any, across a stream channel, water course, or natural drainage area which impounds or diverts water. All structures necessary to impound a single body of water shall be considered as one dam.

Dam height is measured from the point of lowest elevation of the toe of the dam or barrier. Regulated dams are those structures that are more than 8 feet in height or impound more than 25 acre-feet of water, or are classified as high-hazard. Dams that are built on a stream or watercourse with no continuous flow are exempt, except when classified as high hazard.

Hazard Classification
High Hazard (Class C) - Dam failure may cause loss of life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads. Dams constructed in residential, commercial or industrial areas shall be classified as high hazard dams, unless otherwise classified by the Commission on a case-by-case basis.

Significant Hazard (Class B) - Dam failure may cause damage to main roads, minor railroads, or cause interruption of use or service of relatively important public utilities.

Low Hazard (Class A) - Dam failure may cause damage to farm buildings (excluding residences), agricultural land, or county or minor roads.

a. Abandonment: Not defined.
b. Engineer: A (professional) engineer with experience in the design of dams who is registered with the State of Mississippi Board of Registration for Professional Engineers and Land surveyors.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined.
f. Person: The State or other agency or institution thereof, any municipality, political subdivision, public or private corporation, individual, partnership, association or other entity, and includes any officer or governing or managing body of any
municipality, political subdivision, public or private corporation or the United States, or any officer or employee thereof.

g. **Repairs (Alteration):** Any change in the surface or cross-section of existing dams and/or appurtenant works or any modification to appurtenant structures, other than minor grading and fill associated with routine slope and turf maintenance activities. Examples of alterations or repairs include such work as: adding significant amounts of material to, or removing material from, the cross-section of a dam; changing the dimensions or elevations of an emergency or overflow spillway; replacing pipe or in any other way altering a principal spillway; building a roadway on or across any part of a dam; burying pipelines; or in any way altering the approved operational features of a dam.

h. **Spillway:** Not defined.

Commission – The Mississippi Commission on Environmental Quality
Department or MDEQ – The Mississippi Department of Environmental Quality
Permit Board or Board – The Mississippi Environmental Quality Permit Board

**Program Funding**
The Board and Commission are authorized to expend available State funds and to receive funds from federal agencies. M.C.A. § 51-3-39.
Funding for the construction and maintenance of State-owned dams is set forth under M.C.A. § 19-5-92.

**Fees and Costs**
Filing fees are not addressed in State dam safety laws.

**Permit/Approval Process**
Any person proposing to construct, enlarge, repair or alter a dam or reservoir shall submit an application to the Permit Board, on forms prescribed by the Board at least thirty (30) days prior to commencement of construction. The submittal must include a USGS topographic map, or portion thereof, attached to it showing the location of the proposed dam and reservoir including a clearly marked access route to the site and marked locations and general descriptions of all buildings, drainage structures or culverts, roads, railroads, bridges, and utility lines within two-miles downstream of the site of the proposed dam. Design plans and construction drawings shall be submitted to and approved by the Board prior to commencement of construction of a high hazard or significant hazard dam. LW-4(III)(B), M.C.A. § 51-3-39.
Prior approval is not necessary when undertaking emergency repairs according to the regulations. Written construction authorization is also not required for a peripheral dam or levee eight feet or less in height, measured from the point of lowest elevation of its toe, regardless of the impounded storage volume; or a dam that impounds twenty-five acre-feet or less at maximum storage volume; or a dam that does not impound a watercourse with a continuous flow of water as determined by the Commission. LW-4(II)(B).
Owners must also get permission from the State Levee Board if construction on a stream or watercourse is within a levee district. A surface water permit is required if an owner is going to draw water from the reservoir. The regulations spell out this permitting procedure.
Any person intending to acquire the right to store or use water from a reservoir formed by a dam on a watercourse, regardless of whether or not written construction authorization is/was required under these regulations, may do so only by making an application for a surface water use permit to MDEQ. M.C.A. § 51-3-39, LW-4(II)(3).
**Inspection Process**
The Permit Board and Commission shall be authorized to make inspections of dams and reservoirs, regardless of whether or not written construction authorization therefore was required M.C.A. § 51-3-39. The owner and/or operator should perform a visual inspection of the dam at least every sixty days and after every major rainfall event over the watershed. LW-4(VI)(A).
The owner or operator of a high hazard or significant hazard dam shall have a detailed inspection of the dam performed by a registered professional engineer with experience in the design and construction of dams not later than March 1, 2006, and thereafter at such recurring intervals as directed by the Department. LW-4(VI)(B).

**Right of Entry**
MDEQ employees are authorized to make inspections at any time to evaluate the operation, maintenance, and structural integrity of dams and reservoirs. LW-4(VI)(C)

**Operation and Maintenance**
The owner and the operator of a dam shall be responsible for the proper operation and maintenance as well as the structural integrity of the dam. LW-4(VI)(A)
The owner of an existing dam, regardless of its condition, that poses an unacceptable threat to downstream lives or property may be required by the Commission either to bring the dam into compliance with current standards or take the dam out of service by draining the impoundment and removing the dam. LW-4 (IV)(B)
Dams or reservoirs may not be constructed to impair the water rights of others; the Commission may determine minimum water flow rates necessary to protect downstream users (MCA §51-3-39). The owner or operator shall be required to perform, at the owner’s or operator’s expense, such work as may be necessary to correct deficiencies in maintenance and operation or accomplish necessary repairs identified by such inspections. LW-4(VI)(C)

**Emergencies/Emergency Action Plans**
Prior written authorization is not required for emergency repairs to a dam that is likely to breach. The Commission may direct the owner of a high hazard dam to develop an Emergency Action Plan (Regulations Section 7–C 15). The owner or operator of a high hazard dam shall develop and Emergency Action Plan (EAP) for the dam. The EAP shall be submitted to the Board for approval. Once approved, the Board will maintain a copy of the EAP on file. The owner or operator of the dam shall review the EAP on an annual basis to assure that the information contained therein is current. Revisions to the EAP, as necessary, shall be furnished to the Board and all other persons involved in the implementation of the EAP. The owner or operator also shall be responsible for conducting or coordinating periodic training and exercises to assure that personnel involved in the implementation of the EAP are properly prepared to carry out their responsibilities in the event of an emergency. LW-4(IV)(K).

**Owner Non-Compliance/Violations/Penalties**
When the Commission finds a dam in violation of these laws or regulations, the Commission may cause the dam to be removed and/or may revoke or modify any other authorization pertaining thereto. M.C.A. § 51-3-39.
If an owner is found in violation of these provisions, he is guilty of a misdemeanor and may be fined up to $200. Each day constitutes a separate offense. If an owner willfully violates a commission order to repair or modify a dam, he may be fined up to $25,000 for each offense. M.C.A. § 51-3-55.
If maintenance and operation deficiencies are not corrected or repairs are not made as specified in the inspection report, the Commission may order owners or operators to take remedial action or remove the dam in order to safeguard lives and property. LW-4(VI)(C).

Any person who knowingly submits false or inaccurate information in support of a permit application or a notice of claim or who willfully fails to comply with the conditions of a permit issued by the board or who willfully violates orders issued by the Commission shall, upon conviction, be guilty of a misdemeanor and fined not less than $100.00 within the discretion of the court. Each day in which such violation exists or continues shall constitute a separate offense.

**Recordkeeping**

Once an EAP is approved, the Board keeps it on file. LW-4(IV)(K).

The owners and operators of high hazard or significant hazard dams shall maintain records and documents related to the original construction, recurring inspections, maintenance, repairs, and alterations of the dam for the life of the project. Such records shall be made available for inspection, or copies of such record furnished, upon request by the Department. LW-4(V)(J).

**Oversight**

According to law, anyone aggrieved by the decision of the Commission may appeal to the circuit court in the county where the structure is located. The State Attorney General shall represent the Commission. The law describes this grievance process in detail. Also, any person aggrieved by any initial action of the Permit Board to issue, deny, transfer, modify or revoke a permit or written authorization may request an evidentiary hearing before the Permit Board. LW-4(X).

Procedures for hearings and further appeals of Permit Board decisions are set forth in M.C.A. § 49-17-29.

**Miscellaneous**

The law mentions that the Commission can make decisions on applications for permits only after considering the downstream safety and water rights protection.

- **Complaints to Unsafe Conditions**
  - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

- **Environmental Impact**
  - Prevention of water pollution is stated as one of the purposes of the statute.

- **Severability**
  - The dam safety laws and regulations do not specifically address severability.

- **Supplemental Reference Materials**
  - The dam safety laws and regulations do not specifically address supplemental reference materials.
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Summary
[Pros] Unsafe or “noncompliant” dams are considered a public nuisance, and may be dealt with as such. Owners of property within one (1) mile of a dam that has been developed for use of the impounded waters above the dam – erected for a period of thirty years or more – have the right and authority to repair, maintain, or reconstruct the dam. There is also a provision allowing for injured parties to collect from dam owners double the damages for injuries resulting from unauthorized dam construction or enlargement. A “Dam and Reservoir Safety Council” – consisting of seven (7) members, no more than four (4) from the same political party, appointed by the Governor with advice and consent from the Senate – regulates dam safety under the Council. The three (3) permit system is effective in providing a variety of regulatory assurances during all phases of dam existence, construction, and operation. Conditions may be imposed upon such permits, which may also be revoked or suspended upon noncompliance, or deterioration of or change in dam or reservoir conditions. Permit applications are considered on a case-by-case basis. The permit transfer process is comprehensive. The State may remove or alter any dam posing a threat to life and property; permits shall be suspended and only reinstated when the owner – at owner expense – has completed the necessary works. Any dams or reservoirs deemed by the chief engineer to be abandoned and considered a threat to public safety may be altered, repaired, or removed at State expense, with the attorney general authorized to bring action to recover such expenses from the owner through the appropriate legal avenues. Any emergency expenses incurred by the State during such actions are recoverable from the owner. Penalties range from $500 to $10,000, and/or one (1) year in jail.
Industrial water retention structures have additional permit requirements.
[Cons] The inspection requirements are relatively weak. There are no fees for applications or inspections. There are no program funding mechanisms in the State dam safety laws. The dam classifications are atypical. Dams used primarily for agricultural purposes are exempt from regulation, conditioned upon Council notification.

Citation and Title
[Statute] Laws pertaining to Missouri dam safety are found in Sections 236.400 - 236.500 of the Revised Statutes of Missouri (R.S.M.) -- enacted in 1889, and last amended in 1993.
[Administrative Agency] Department of Natural Resources, Dam and Reservoir Safety Council

Jurisdiction/Powers of Council
The Dam and Reservoir Safety Council ("council") of Missouri oversees the safety of dams and reservoirs. R.S.M. § 236.410.1. Membership on the council is described in R.S.M. § 236.410.2, and requires a diversity of professional experienced in engineering, earthmoving contracting, industry, and geology. One member of this council shall be the owner of a dam or reservoir. Members receive only travel and subsistence compensation.
The council has responsibility to provide adequate protection of public safety, life and property, and has statutory powers for policy making, adopting rules, regulations, standards and guidelines, and issuing permits. The council takes recommendations on the above from the Department of Natural Resources ("DNR"), and must also provide any interested persons opportunity for hearing regarding regulations. The council (or DNR) has the authority to administer and enforce the rules, regulations, standards, and guidelines adopted by the council, and assists the council in their enforcement of the law. 10 C.S.R. 22-1.010.
According to the law, the chief engineer of the Dam and Reservoir Safety Program ("chief engineer") is responsible for administering the law for the council. The chief engineer reviews and approves permit applications, inspects dams and reservoirs, enforces the law and rules, employs staff, recommends rules, standards and guidelines, and mitigates unsafe conditions. The chief engineer may at any reasonable time, enter upon private land as necessary to make an inspection. R.S.M. § 236.425. The chief engineer may take any action deemed necessary in emergency conditions to ensure safety. R.S.M. § 236.455. The chief engineer has the statutory authority to hold public hearings and must do so before regulations are approved. R.S.M. § 236.425. The chief engineer may also retain consultants, assistants, and other employees, within appropriations available therefore, as needed on a part or full time basis to carry out the provisions of these laws. R.S.M. § 236.430.

**Liability and Immunity**

Adherence to the law does not guarantee the safety of any dam or reservoir or relieve the owner of any liability in the event of dam failure. 10 C.S.R. 22-3.010.

In the absence of willful misconduct, no action shall be brought against the council, the chief engineer, or his agents or council employees for the recovery of damages due to dam failure or operation, including emergency actions, issuance of enforcement orders, and permit approval R.S.M. § 236.475.

Nothing in these regulations shall be construed to eliminate the liability of the previous owner for damages or injuries caused by dam failure, nor a new operator who has not obtained a permit nor had an existing permit transferred to his/her name. 10 C.S.R. 22-2.050(6).

**Definitions/Dam Classifications**

*Jurisdictional dams* are defined as any artificial or man-made barrier which does or may impound water and is 35 feet or more in height. R.S.M. § 236.400(5).

Dams exempt from jurisdiction include those licensed under the Federal Power Act, agricultural dams, and dams regulated by other agencies with standards as stringent as the Missouri dam safety law. 10 C.S.R. 22-1.020.

There are two (2) types of dams and reservoirs: (1) conventional; and (2) industrial water retention, distinguished on the basis of their reservoir contents and the length of the time period during which active dam building occurs. 10 C.S.R. 22-2.030. Conventional dams are built in one continuous operation over a short span, and filled after completion. Industrial water retention dams are built in phases, over a long period of time, during which filling occurs after phase completion.

*Dam height* means the difference in the elevation of either the natural bed of the stream or watercourse, or the lowest point on the toe of the dam and the dam crest elevation. 10 C.S.R. 22-1.020(24).

**Hazard Classification**

The owner shall have an engineer determine the hazard class upon application for construction, however, should he/she choose not to, the chief engineer may assign a classification. Bedrock, pore pressure, earthquake intensities, and other local environmental factors shall be considered 10 C.S.R. 22-3.010. The hazard classification criteria are defined in the rules as the "downstream environmental zone", the area downstream that would be inundated upon dam failure. Three environmental classes are defined:

*Class I* -- Contains 10 or more permanent dwellings or any public building

*Class II* -- Contains 1 to 9 permanent dwellings or 1 or more campgrounds with permanent water, sewer, and electrical services or 1 or more industrial buildings

*Class III* -- Everything else
If conditions change in a zone and the environmental class is changed, the dam owner must meet the new standards and criteria. 10 C.R.S. 22-2.040(1).

a. Abandonment: Not defined.
b. Engineer (State): An experienced professional engineer – not necessarily registered in Missouri – selected under the state merit system on basis of professional experience directly related to the design and construction of dams and reservoirs. The council bases its judgment upon the recommendations of the chief engineer.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: A person who owns, controls, operates, maintains, manages, or proposes to construct a dam or reservoir including: the State and its councils, institutions, agencies, and political subdivisions; a municipal or quasi-municipal corporation; a district; a public utility, a natural person, firm, partnership, association, corporation, or legal entity; the duly authorized agents, lessees, or trustees of any of the foregoing; receivers or trustees appointed by any court for any of the foregoing.
f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: Any passageway, channel, or structure, open or closed or both, designated expressly or primarily to discharge excess water from a reservoir after the water storage elevation has been reached. Spillway designs are based on the environmental class of the dam, becoming more stringent with lower classification ratings.

Program Funding
The dam safety statutes and regulations do not specifically address program funding.

Fees and Costs
There are no fees included in the laws regarding permitting. Owner pays for emergency works taken on their behalf or on that of the State; costs for the removal, repair, or alteration of “abandoned” dams; inspections by their own engineers.

Permit/Approval Process
Owners of jurisdictional dams must obtain a permit as required by law. R.S.M. §§ 236.435 and 236.440. Instructions for applying for a permit for an industrial retention structure are common throughout the industry, and are included in R.S.M. § 236.465. More specific requirements for the approval process are included in the rules. See 10 C.S.R. 22-2.050 to 2.060. Three permit types are described in the rules: registration permits, construction permits, and safety permits. Each type has specific requirements. 10 C.S.R. 22-3.010 to 3.050.

1) Construction permits (10 C.S.R. 22-2.020) apply to construction of a new dam or reservoir, alteration, enlargement, reduction, repair, or removal of a new or existing dam, reservoir, or appurtenant works. They are issued after chief engineer has received from applicant all necessary information prior to construction or alteration of a dam or reservoir.

2) Safety permits [also called Operating permits] (10 C.S.R. 22-2.020) apply to the operation of a dam or reservoir and are issued after construction is complete; once the chief engineer has concluded that the works were completed in accordance with the provisions of the construction permit. Safety permits must be renewed every five (5) years. This permit does not alter the owner’s liability.

3) Registration permits (10 C.S.R. 22-2.020) are required for dams or reservoirs built prior to the enactment of State dam safety laws. These permits also apply to dams in existence prior to the date they became subject to the law. Registration permits are only issued after
the council determines that the dam meets the required safety provisions, and any recommendations by the chief engineer are satisfied. Registration permits may include conditions necessary to bring the dam or reservoir into compliance, and are valid for five (5) years. The State may remove or alter any dam posing a threat to life and property; permits shall be suspended and only reinstated when the owner – at owner expense – has completed the necessary works. R.S.M. § 236.445.

Any dams or reservoirs deemed by the chief engineer to be abandoned and considered a threat to public safety may be altered, repaired, or removed at State expense, with the attorney general authorized to bring action to recover such expenses from the owner through the appropriate legal avenues. R.S.M. § 236.450.

Permits are transferable under R.S.M. § 236.460, with the approval of the chief engineer. Construction must commence within one year of approval. Permit holders on record shall be held responsible for compliance with these rules and standards. Any new owner failing to transfer a permit may apply for new one with the council, upon proof of ownership. Previous owner’s responsibilities are not extinguished until permit transfer is complete. Nothing in these regulations shall be construed to eliminate the liability of the previous owner for damages or injuries caused by dam failure, nor a new operator who has not obtained a permit nor had an existing permit transferred to his/her name. 10 C.S.R. 22-2.050(6).

Dams and reservoirs designed by, or where an agency engineer monitors the construction, do not need a permit but plans must be filed with the chief engineer. 10 C.S.R. 22-2.010(5). Permit revocation is at the discretion of the council or the chief engineer and is described in the rules. 10 C.S.R. § 22-2.080. The council can suspend a permit due to unsafe conditions at a dam. Removal must be done according to the provisions of the construction permit. Violations may be issued for noncompliance. R.S.M. § 236.440. Owners must notify the council after removal is complete and in compliance. 10 C.S.R. 22-2.050.

Industrial water retention structures may be exempt if regulated and inspected by another state or federal agency, but may have supplemental permit requirements. R.S.M. § 236.465.

**Inspection Process**

All dams must be inspected on a periodic basis. The council, with advice and assistance from the chief engineer, shall carry out a State program of inspection of dams and reservoirs. R.S.M. § 236.420. The chief engineer shall determine by inspection if a dam or reservoir is a threat to public safety, life, or property. 10 C.S.R. 22-4.010.

An experienced professional engineer shall inspect dams before a registration safety permit will be issued. 10 C.S.R. 22-3.030 and 10 C.S.R. 22-3.050. Because safety permits and registration permits are renewed at least every five years, inspections by experienced professional engineers are required at least every five years, unless safety requirements require a shorter period of time. The rules describe what should be included in an inspection, focusing on surface examinations, spillway capacity, construction practices, geology, and other relevant factors. 10 C.S.R. 22-3.030. Permit applications must include procedures for regular inspection by the owner, including a timetable for inspection and reporting format. 10 C.S.R. 22-3.040.

Inspection fees and construction inspection schedules are not included in the law or rules. Remedial work will be done at the expense of the owner. R.S.M. § 236.445. Owners are not required to have a bond to ensure the financial capability of the project.

**Right of Entry**

The chief engineer may at any reasonable time, enter upon private land as necessary to make an inspection, except in case of emergency wherein no notice is required. Owners shall permit entry to its property to perform inspection. 10 C.S.R. 22-3.030.
**Operation and Maintenance**
Dams and reservoirs must be operated and maintained according to safety/operation permit provisions and conditions.
A maintenance program is required and shall include: erosion control on embankments; monitoring emergency spillway; spillway maintenance; emergency action plans; seepage observation and monitoring; and any instrumentation monitoring. 10 C.S.R. 22-3.030.
Instrumentation and monitoring of seepage water shall be provided where necessary. Any settling or movement of dam foundation shall be measured, if possible. 10 C.S.R. 22-3.040.

**Emergencies/Emergency Action Plans**
After a structure has been classified as dangerous to public safety, life or property – and there is insufficient time to issue an enforcement order – the chief engineer may take any action deemed necessary in emergency situations to protect life and property. R.S.M. § 236.455. Costs to take such action may be recovered from the owner through legal action. Actions depend on progression of dam deterioration, hazard class, and resources available to the chief engineer at that time. 10 C.S.R. 22-4.010.
The chief engineer may also contact the attorney general to pursue legal recourse against noncompliant dam owners, in order to ensure the safety of the public. 10 C.S.R. 22-4.010.
Emergency action plans are required by regulation. 10 C.S.R. 22-3.030(1)(B) and 3.040(1)(A)15.

**Owner Non-Compliance/Violations/Penalties**
R.S.M. § 236.240 states that all stoppages and obstructions not made according to law shall be deemed to be public nuisances, and may be dealt with as such. If upon inspection, any dam or reservoir is deemed unsafe, the council may issue the owner a notice of violation. If the violation is not abated within a reasonable time, the council may request the attorney general or a prosecuting attorney to take legal steps necessary to protect public safety, life and property. Dams may be altered or removed, and permits suspended, by the council if such structures pose a threat to public safety, life, property, or the safety of the dam itself. R.S.M. § 236.445.
Civil penalties of up to $1,000 per day may be assessed for each day the violation continues.
Willful violation of the laws pertaining to dam safety constitutes a misdemeanor and carries fines not less than $500 nor greater than $10,000 and/or a 1 year jail sentence. Each day of the violation constitutes a separate offense. R.S.M. § 236.500.
Enforcement orders may be issued by the chief engineer or council where a dam or reservoir poses a serious threat to public safety. If an owner does not comply with this order within thirty-days, legal recourse may be sought, or immediate council action may be taken. 10 CSR 22-4.020.
Owners of dams built or enlarged without approval shall forfeit to any party injured double damages from such injury, to be recovered by civil action. R.S.M. § 236.270.

**Recordkeeping**
Recordkeeping and monitoring procedures must be maintained throughout the construction and modification process to provide any information of progress and difficulties experienced during construction. Such records must be kept adequate and made available for chief engineer review upon request. 10 C.S.R. 22-3.040.
Records of hearing shall include all written testimony, data, records, etc. 10 C.S.R. 22-2.100.

**Oversight**
Permit revocations or denials are subject to council appeal. 10 C.S.R. 22-2.100. Any party shall be afforded an opportunity for hearing before the council for review of denial or revocation decisions, within thirty-days after notice is served. A description of the hearing process is included in R.S.M. § 236.470.
All decisions are subject to judicial review according to the law. However, judicial review may only be available after all administrative remedies are exhausted. R.S.M. § 236.480.

**Miscellaneous**
The council shall retain and compensate within appropriations and as necessary, consultants to carry out the provisions of the law and shall describe the consultants' powers and duties. R.S.M. § 236.430.

Owners of property within one (1) mile of a dam that has been developed for use of the impounded waters above the dam – erected for a period of thirty years or more – have the right and authority to repair, maintain, or reconstruct the dam. R.S.M. § 236.255.

These provisions do not affect any rights to water entering, discharged from, or impounded by a dam or reservoir. R.S.M. § 236.485.

- **a. Complaints to Unsafe Conditions**
  - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

- **b. Environmental Impact**
  - The dam safety laws and regulations do not specifically address environmental impact.

- **c. Severability**
  - The dam safety laws and regulations do not specifically address severability.

- **d. Supplemental Reference Materials**
  - The dam safety laws and regulations do not specifically address supplemental reference materials.
Summary
[Pros] The Montana Code and the Administrative Rules are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. The Rules are exceptionally well organized and thorough. The permit application process is clearly set out subchapter 3 and subchapter 4 of the Rules. A permit is required for new construction, repair, alteration, or enlargement of a dam. In addition, an owner is required to have an operation permit. The Rules also set forth specific high hazard dam design and construction criteria including hydrologic standard for emergency and principal spillways, instrumentation, and breach or removal of an earth dam.
[Cons] The Dam Safety Act and Dam Safety Rules focus primarily on the regulating high hazard dams. In fact, neither the Dam Safety Act nor the Rules define or establish other hazard classifications. Presumably then, the State has only two dam hazard classifications, high hazard potential dams and all other dams. Rather than leaving the responsibility of inspection up to the owner, the Rules hold both the department and the owner responsible for inspecting high hazard dams, at least once every five years. Neither the Dam Safety Act nor Rules discuss program funding. Although an application fee of $125 is assessed to inspect a dam to determine its classification, no permit application fees are assessed.

Citation and Title
[Rules/Regulations] Dam Safety Rules are contained in Title 36: Department of Natural Resources and Conservation; Chapter 14: Safety of Dams 1989.
[Administrative Agency] Department of Natural Resources and Conservation, Water Division

Jurisdiction/Powers of Department
The general responsibility to administer and enforce the provision of the laws and rules shall be carried out by Water Division of the Department of Natural Resources and Conservation (“department”).

The law grants the department the power to adopt rules to classify high-hazard dams and reservoirs; to review, approve and issue permits; to govern inspections; establish safety standards for the design, construction, operation, and maintenance of high-hazard dams and reservoirs; to establish emergency preparedness procedures and warning procedures; and to establish fees commensurate with costs to cover inspections under the law. M.C. § 85-15-110.

The department may also invoke legal counsel to enforce the laws and rules and to conduct proceedings under it. M.C. § 85-15-109.

The department is empowered to call for remedial work to be done if it deems necessary. The department may also cancel, or amend, an operating permit whenever it determines that the dam or reservoir constitutes a danger to life. M.C. § 85-15-216.

The department may takeover a dam in the event of an emergency. M.C. § 85-15-215.

Liability and Immunity
Nothing in the rules or laws relieves an owner of a dam or reservoir with an operation permit of any legal duty, obligation, or liability incident to its ownership or operation, including any damages resulting from leakage or overflow of water or floods caused by the failure or rupture of the dam or reservoir. M.C. § 85-15-305. The owner of a dam or reservoir that has been
permitted by the department in accordance with this chapter is not, in the absence of negligence, 
liable for damages resulting from the flow of water from the dam or reservoir which are of 
sufficient magnitude to exceed the limits of the 100-year floodplain as defined in M.C. § 76-5- 
103. In addition, the owner of any dam or reservoir that has been permitted by the department in 
accordance with the law may, without incurring liability, allow passage through the reservoir of 
inflows without diminution. Liability provisions for the department are not explicitly stated in 
the laws or rules.

Definitions/Dam Classifications
Montana law defines a *dam* as any artificial barrier, including appurtenant works, used to 
impound or divert water with an impounding capacity of 50 acre-feet or greater measured to the 
crest of the dam embankment. Rule 36.14.01.

Dam hazard classification is based on the consequences of dam failure - not the condition, 
probability, or risk of failure.
A dam is classified *high hazard* if the impoundment capacity is 50 acre-feet or larger and it is 
determined that a loss of human life is likely to occur within the breach flooded area as a result of 

Administrative rules apply to high-hazard dams except for sub-chapter 2, "Hazard 
Classifications," and sub-chapter 8, "Complaints."

a. **Abandonment:** Not defined.
b. **Engineer:** A registered professional engineer licensed to practice in the state of 
   Montana under Title 37, chapter 67, part 3.
c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** A person who owns, controls, operates, maintains, manages, or proposes to 
   construct a dam or reservoir.
f. **Person:** An individual, association, partnership, corporation, business trust, state 
   agency, political subdivision, utility, municipal or quasi-municipal corporation, or 
   other entity or authorized agent, lessee, or trustee of any of the foregoing.
g. **Repairs:** Not defined.
h. **Spillway:** Not defined.

Program Funding
These rules do not mention program funding.

Fees and Costs
An inspection fee of $125 is assessed for an application for hazard determination. Under these 
rules, no permit application fee is assessed.

Permit/Approval Process
An owner who wishes to construct, alter, repair, enlarge, or remove a high-hazard dam shall 
apply for and receive from the department a construction permit. Rule 36.14.301. An application 
for a construction permit must include the application form, engineering design report, and three 
sets of the construction plans and specifications.

Rule 36.14.309(1)(b), specifies a performance bond of 100 percent of the estimated construction 
cost. The construction plans and specifications and engineering report must be prepared by or 
under the supervision of an engineer experienced in dam design and construction and must be 
certified with the seal of the engineer.
The construction permit application must include detailed description of the work to be 
performed and a statement of the requirements for the permanent construction. Rule 36.14.303,
sets forth what an engineering design report for construction of a new dam must include. In summary, contact information of the engineer; storage capacity of the reservoir; general description; geology report; geotechnical report; hydrologic and hydraulic report; drainage design report; quality control plan; a plan for monitoring the performance of the dam; and a report of the design data. Within 30 days after receipt of the application, the department shall notify the applicant of the approval/disapproval of the dam or the need for more information.

Rule 36.14.306 sets forth that the engineering design report for a construction permit application to repair, alter or enlarge a dam must contain those items listed in Rule 36.14.303. The engineering design report must also include detailed construction plans and specifications. Rule 36.14.306. Construction work must be started within one year from the date of approval. Rule 36.14.309.

A person proposing to construct a dam or reservoir with an impounding capacity of 50 acre-feet or more measured at the maximum normal operating pool shall make application to the department for a determination of whether the dam or reservoir is a high-hazard dam. M.C. § 85-15-209, Rule 36.14.202. An application for hazard determination must be determination must be submitted to the department on a form provided by the department and must contain the name, address, and phone number of the owner; reservoir and dam general description to include not less than the impoundment capacity, dam height, location and purpose; maps showing the location of the proposed structure; signature of the owner and date of the signature; and an inspection fee of $125. A person may not begin construction of a high-hazard dam as determined under M.C. § 85-15-209 without first obtaining a construction permit from the department. M.C. § 85-15-209. Applications for a permit to operate high-hazard dams must include an operation plan containing operation, maintenance, and emergency procedures. The application must also include an inspection report.

**Inspection Process**

[State]

A high-hazard dam, whether or not previously permitted by the department, must be inspected as often as considered necessary by the department, but at least once every 5 years. A qualified engineer must perform periodic inspections. M.C. § 85-15-213. For construction of any high-hazard dam, an engineer must be in charge of and responsible for inspections. M.C. § 85-15-211. During construction, the owner will pay for the department's actual and necessary costs, excluding salary and travel expenses, incurred for occasional inspections if a need arises from a particular circumstance to ensure a safe dam.

[Owner]

Inspection requirements are found in the Rules 36.14.601-603. The owner of a high-hazard dam shall have periodic inspections conducted by a qualified engineer at least once every five years. The owner shall bear the cost of inspection. The engineer shall prepare a written report and photographic record of the inspection. The engineer shall deliver the report and discuss it with the owner within 60 days of the investigation.

**Right of Entry**

Under the rules, any employee or agent of the department authorized by the director of the department may enter upon land to carry out the purposes of this chapter. The department or its agents shall give reasonable notice to the landowner of the intention to enter upon the land. M.C. § 85-15-108.

**Operation and Maintenance**

An operation plan must be prepared by the owner and approved by the department prior to operation of the high-hazard dam or reservoir. The operation plan must set forth: (a) a reservoir operation procedure; (b) a maintenance procedure for the high-hazard dam and appurtenant
works; and (c) emergency procedures and warning plans. M.C. § 85-15-212. General maintenance and ordinary repairs do not require a construction permit if the construction or repairs do not impair the safety of the dam if done properly. These activities include removal of brush or weeds; cutting trees; removal of slash from the embankment or spillway, and removal of small stumps. Also included, repair of gullies or minor rodent damage, surface grading of the embankment, and placement of additional riprap and bedding on the upstream slope or in the spillway. Rule 36.14.308.

**Emergencies/Emergency Action Plans**

Emergency procedures are contained in the Rules 36.14.701-703. If at any time it is discovered that an emergency or an immediate hazard condition exists, the owner or his representative shall immediately take remedial measures, notify the local sheriff, and notify the department of the emergency action or repairs or breaching to be instituted by the owner; and for dams being operated under an operation permit, the owner shall immediately implement the emergency action plan. Rule 36.14.406.

**Owner Non-Compliance/Violations/Penalties**

An owner of a dam with an impounding capacity of 50 acre-feet or greater measured at the maximum normal operating pool who fails to comply with a provision of this chapter or a rule or order of the department adopted or made pursuant to this chapter is subject to a civil penalty not to exceed $1,000. Each day of violation is a separate offense. M.C. § 85-15-503. If at any time during construction of any dam or reservoir the department finds that the work is not being done in accordance with the provisions of the permit, including revisions, it shall give a written notice and order by certified mail or by personal service to the owner. The department may order that no further work be done until evidence of compliance has been submitted to the department. Rule 36.14.312.

**Recordkeeping**

The owner of a dam shall retain records of all inspections, including records of actions taken to correct conditions found in such inspections.

**Oversight**

Someone whose property may be endangered by an unsafe dam may file a complaint with the department. M.C. § 85-15-214. If any of the above find that persons or property are endangered by reason of the dam or reservoir, a written affidavit must be submitted. The owner of the dam or reservoir may answer the complaint. If any of the above find the dam or reservoir insufficient or insecure, they must declare such dam or reservoir a nuisance and order all the water be drawn therefrom. The owner must bear the costs. Any party to the court proceedings may move for a new trial and appeal as in other cases.

**Miscellaneous**

M.C. § 85-15-305 addresses the owner's liability if an operation permit is granted but says nothing concerning either strict liability or liability with negligence for dams not having an operation permit. Historically, there have been only two previous court cases held in the State and each had a different conclusion.

- **Complaints to Unsafe Conditions**
  - See “Oversight”.
- **Environmental Impact**
  - The dam safety laws and rules do not specifically address environmental impact.
- **Severability**
  - The dam safety laws and regulations do not specifically address severability.
d. **Supplemental Reference Materials.**
- The dam safety laws and regulations do not specifically address supplemental reference materials.
NEBRASKA

Summary
[Pros] The laws are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. The statute promulgates an application fee for approval of construction, reconstruction, enlargement, alteration, breach, removal, or abandonment of a dam. The department shall establish a fee not to exceed $200 for a dam of less than twenty-five feet in height, $300 for a dam twenty-five to fifty feet in height, and $400 for a dam in excess of fifty feet in height. The laws provide for the Dam Safety Cash Fund, which consists of fees credited pursuant to R.R.S. Neb. § 46-1655 and any money specifically appropriated to the fund by the Legislature. The department shall administer the fund. Money in the fund may be expended by the department for costs incurred by the department in the administration of the Safety of Dams and Reservoirs Act. The laws provide a comprehensive “definitions” section.

[Cons] The laws do not specifically address what inspection duty is left to the owner of a dam.

Citation and Title
[Statute] Laws pertaining to dam safety are located under Chapter 46, Article 2: "Surface Water". R.R.S. Neb. § 46-1601.
[Rules/Regulations] Regulations are in Title 457: Rules for Surface Water - Department of Water Resources ("Rules").
[Administrative Agency] Department of Water Resources

Jurisdiction/Powers of Department
The purpose of the Safety of Dams and Reservoirs Act is to regulate all dams and associated reservoirs for the protection of public health, safety, and welfare and to minimize the adverse consequences associated with the potential failure of such dams and reservoirs. The Department of Water Resources ("department") is given jurisdiction over all matters pertaining to water rights for irrigation, power, or other useful purposes except as such jurisdiction is specifically limited by statute.

The department may adopt and promulgate rules and regulations containing standards for the design, inspection, construction, reconstruction, enlargement, alteration, breach, removal abandonment, and periodic testing of emergency action plans of dams to carry out the purpose of the Safety of Dams and Reservoirs Act. R.R.S. Neb. § 46-1651. R.R.S. Neb. § 46-1649, empowers the department to make inspections of dams and/or cause the owner to gather data, including advances made in safety practices elsewhere, as may be needed for a proper review and study of the various features of the design, construction, reconstruction, enlargement, alteration, breach, removal, or abandonment of dams. Under R.R.S. Neb. § 46-1644, the department shall employ an engineer and such individuals otherwise qualified by training and experience in the design, inspection, construction, reconstruction, enlargement, repair, alteration, maintenance, operation, breach, removal, or abandonment of dams as necessary to carry out the Safety of Dams and Reservoirs Act. The department may take any administrative or legal action necessary to enforce the Safety of Dams and Reservoirs Act. R.R.S. Neb. § 46-1650.

R.R.S. Neb. § 46-241 requires any person intending to construct and operate a storage reservoir to make an application to the department upon a prescribed form. In addition, § 46-241 states that the owner is responsible for the safety of the dam. In the event of an emergency, the department, along with other governmental agencies, assists in the implementation of the Emergency Preparedness Plan. R.R.S. Neb. § 46-277 gives the department the right to call for remedial
work, to enter a facility at any reasonable time, and to cite non-compliance with the laws and regulations.

**Liability and Immunity**
R.R.S. Neb. § 46-241 (2) states that the owner shall be liable for all damages arising from leakage or overflow of the water therefrom, or from the breaking of the embankment of such reservoir. Under R.R.S. Neb. § 46-1639, no action shall be brought against the state, the department, or its agents or employees for the recovery of damages caused by the partial or total failure of any dam by reason of control and regulation thereof pursuant to the Safety of Dams and Reservoirs Act.

**Definitions/Dam Classifications**
*Dam* means any artificial barrier, including appurtenant works, with the ability to impound water, wastewater, or liquid-borne materials and which (a) is twenty-five feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier, or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse, to the maximum storage elevation or (b) has an impounding capacity at maximum storage elevation of fifty acre-feet or more, except that any barrier described in this subsection which is not in excess of six feet in height or which has an impounding capacity at maximum storage elevation of not greater than fifteen acre-feet shall be exempt, unless such barrier, due to its location or other physical characteristics, is classified as a high hazard potential dam.

*Dam height* shall be measured from the natural bed of the stream or watercourse at the downstream toe of the dam to the top of the dam.

*Dam hazard classification* is determined according to the potential for loss of life and property damage that would occur should a dam fail. The following dam classes are defined accordingly.

A **high hazard dam**: A dam located where failure may cause loss of life, or serious damage to homes, normally occupied industrial and commercial buildings, important public utilities, main highways, or major railroads.

A **significant hazard dam**: A dam located in areas where failure may damage isolated homes, occasionally occupied buildings, main highways, minor railroads or interrupt public utility use or service.

A **low hazard dam**: A dam located in areas where failure may damage normally unoccupied buildings, undeveloped land, or township and county roads. Source: Rules - Chapter 19.

A **minimal hazard dam**: A dam located in an area where failure or mis-operation of the dam would likely result in no economic loss beyond the cost of the structure itself and the losses principally limited to the owner’s property.

a. **Abandonment**: The process of rendering a dam incapable of impounding by 91) dewatering and filling the reservoir created by such a dam with solid materials and (2) creating a stable watercourse around the site.

b. **Engineer**: A professional engineer licensed under the Engineers and Architects Regulation Act who (1) is competent in areas related to dam investigation, design, construction, and operation for the type of dam being investigated, designed, constructed, or operated, (2) has at least 4 years of relevant experience in investigation, design, construction, reconstruction, enlargement, alteration, breach, removal, or abandonment of dams, and (3) understands adverse consequences and dam failures.

c. **Hazard Potential**: Classification of dams according to the degree of incremental adverse consequences of failure or mis-operation of a dam but does not reflect on the current condition of a dam, including, but not limited to, safety, structural integrity, or flood routing capacity.
d. **Operator:** Not defined.

e. **Owner:** Owner includes any of the following who or which owns, controls, manages, or proposes to construct, reconstruct, enlarge, alter, breach, remove, or abandon a dam: (1) The United States Government and its departments, agencies, and bureaus; (2) the state and its departments, institutions, agencies, and political subdivisions; (3) a municipal or quasi-municipal corporation; (4) a public utility; (5) a district; (6) a person; (7) a duly authorized agent, lessee, or trustee of any person or entity listed in this section; and (8) a receiver or trustee appointed by the court for any person or entity listed in this section.

f. **Person:** Any individual, partnership, limited liability company, association, public or private corporation, trustee, receiver, assignee, agent, municipality, other political subdivision, public agency, or other legal entity or any officer or governing managing body of any public or private corporation, municipality, other political subdivision, public agency or other legal entity.

g. **Repairs (Alteration):** Alterations to an existing dam that directly affect the safety of the dam or reservoir, as determined by the department, but does not include maintenance and repair of the dam to retain its initial structural integrity.

h. **Spillway:** Not defined.

**Program Funding**

The Dam Safety Cash Fund consists of fees credited pursuant to R.R.S. Neb. § 46-1655, and any money specifically appropriated to the fund by the Legislature. Money in the fund shall not be subject to any fiscal-year limitation or provision for lapse of unexpended balance at the end of any fiscal year or biennium. The department shall administer the fund. Money in the fund may be expended by the department for costs incurred by the department in the administration of the Safety of Dams and Reservoirs Act. The State Investment Officer shall invest any money in the fund available for investment pursuant to the Nebraska Capital Expansion Act and the Nebraska State Funds Investment Act. R.R.S. Neb. § 46-1656.

**Fees and Costs**

There is no reference to inspection fees. The statute does, however, promulgate an application fee for approval of construction, reconstruction, enlargement, alteration, breach, removal, or abandonment of a dam. The department shall establish a fee not to exceed $200 for a dam of less than twenty-five feet in height, $300 for a dam twenty-five to fifty feet in height, and $400 for a dam in excess of fifty feet in height. R.R.S. Neb. § 46-1655.

**Permit/Approval Process**

R.R.S. Neb. § 46-241 requires any person intending to construct and operate a storage reservoir for irrigation or any other beneficial purpose to make an application to the department upon a form prescribed and furnished to the applicant without cost. Such application is filed and the proceedings that follow adhere to the same rules and regulations of other applications.

R.R.S. Neb. § 46-257 of the law states that any person intending to construct any dam for any purpose must submit plans, drawings, and specifications of the same to the department for approval. Design plans must bear the stamp of a registered professional engineer. Rules 12.003.08.

Persons intending to construct a low-hazard dam less than twenty-five feet high with an impounding capacity of less than 15 ac-ft below the crest of the lowest open outlet or overflow and with a total storage capacity below the top of the dam of less than fifty acre-feet are exempt from this provision.
Spillway design specifications are found in the Guide for Preparing E.P.P. for Dams and Reservoirs Part II. The stated specifications are recommended by the Department; not required by law.

The owner, per § 46-277, pays for remedial work. There is no reference in the laws or regulations pertaining to bonding requirements or filing fees.

Under R.R.S. Neb. § 46-1652, prior to commencement of construction of any new dam or the enlargement of any dam, the owner shall apply for and obtain from the department written application approval of plans and specifications.

Under R.R.S. Neb. § 46-1653, before commencing the reconstruction or alteration of a dam or the abandonment, breach, or removal of a dam so that it no longer constitutes a dam, the owner shall file an application and secure the written application approval of the department.

Upon completion of a new or reconstructed dam and reservoir, enlargement of a dam or reservoir, alteration of any dam, the removal, breach, or abandonment of a dam, the owner shall file a completion certification with the department accompanied by supplementary descriptive matter signed and sealed by the design engineer, showing or describing the work as actually completed. R.R.S. Neb. § 46-1657, 46-1658, 46-1659.

**Inspection Process**

[State] The department may make periodic inspections during the construction, reconstruction, enlargement, alteration, breach, removal, or abandonment of any dam, for the purpose of ascertaining compliance with the approval of plans and specifications. R.R.S. Neb. § 46-1662. At all other times, the department shall inspect dams for the purpose of determining safety. High hazard potential dams shall be inspected annually. Significant hazard potential dams shall be inspected biennially. Low hazard potential dams shall be inspected once every five years. Minimal hazard potential dams shall be inspected every five years of more. R.R.S. Neb. § 46-1664. If serious safety concerns are found, the department shall require the owner to conduct tests and investigations sufficient for the department to determine the condition of the dam.

[Owner] Article 16 of Chapter 46 of the state statute does not set forth what inspection duty is left to the owner.

**Right of Entry**

R.R.S. Neb. § 46-1648 permits the department or its representatives to enter upon private property of the dam and reservoir owner as necessary in making any investigation or inspection necessary to enforce or implement the Safety of Dams and Reservoirs Act.

**Operation and Maintenance**

The dam safety laws and regulations do not specifically address operation and maintenance.

**Emergencies/Emergency Action Plan**

Emergency procedures are clearly stated in the Guide for Preparing Emergency Preparedness Plans for Dams and Reservoirs. Emergency Preparedness Plans are required for all high hazard dams and some significant hazard dams. R.R.S. Neb. § 46-1647. Emergency Action Plans shall include, but not be limited to: (a) emergency notification flow chart; (b) a statement of purpose; (c) a project description; (d) emergency detection, evaluation and classification; (e) general responsibilities; (f) preparedness; (g) inundation maps or other acceptable description of the inundated area; and (h) appendices. R.R.S. Neb. § 46-1647.

**Owner Non-Compliance/Violations/Penalties**

Violation of the Safety of Dams and Reservoirs Act or any application approval, approval to operate, order, rule, regulations, or requirement of the department under the act is a class V
misdemeanor. Each day that the violation continues constitutes a separate and distinct offense. R.R.S. Neb. § 46-1666.

**Recordkeeping**
The department shall require owners to keep original records and any modifications to construction available and in good order. R.R.S. Neb. § 46-1663.

**Oversight**
The department has authority to call for public hearings upon complaints, petitions, or applications in connection with any matters under its jurisdiction. The Safety of Dams and Reservoirs Act does not deprive the owner of any administrative or judicial recourse to the courts to which such owner is entitled under the laws. R.R.S. Neb. § 46-1643.

**Miscellaneous**
Persons desiring to construct dams who are unable to agree with the owner or claimant of any lands necessary to be taken for the site of any such works or any part thereof, touching the compensation and damages, shall be entitled to condemn the right-of-way over or through the lands of others, for any and all such purposes. R.R.S. Neb. § 46-246.

a. **Complaints to Unsafe Conditions**
- The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

b. **Environmental Impact**
- The dam safety laws and regulations do not specifically address environmental impact.

c. **Severability**
- The dam safety laws and regulations do not specifically address severability.

d. **Supplemental Research Material**
Guidelines for dam operations can also be found in "A Guide for Preparing Emergency Preparedness Plans for Dams and Reservoirs".
NEVADA

Summary
[Pros] The first provision of the revised statute makes clear that the State land registrar must authorize any use of State natural resources. The State Engineer is vested the authority to regulate dam safety in Nevada. Nevada is one of few states to make expressly clear that the statutes apply to “new construction, reconstruction and alteration of old structures.” The Nevada Administrative Code establishes detailed approval and denial criteria for all submitted applications, as well as mechanisms for re-application of denied permits. Contractors qualified according to State requirements must perform all approved construction. Annual fees for water storage capacity are assessed to all qualified dam owner; such fees shall go towards inspection costs. The inspection rules allow the State Engineer to establish State or owner inspection schedules, ranging from once a year for high hazard dams to once every 5 years for not otherwise classified dams. Dam safety program forms are available on-line, providing some guidance for dam owners.
[Cons] Many key elements of State dam safety laws are integrated within Nevada Revised Statutes 533. Adjudication of Vested Water Rights; Appropriation of Public Waters, making it more difficult to identify dam-specific regulations. State inspections are required “from time to time”; owners are not required to inspect their dams, but are required to provide information as to the safety of such dams. Dam safety program funding is not clear, though is in part generated through program fees.

Citation and Title
[Statute] Nevada Revised Statutes (N.R.S.): Title 48, Water; Chapter 535, Dams and Other Obstructions, describes the powers of the state engineer as they relate to the construction and supervision of dams. It was originally enacted as Chapter 110 in March 1951.
[Administrative Agency] Department of Conservation and Natural Resources, Division of Water Resources, State Engineer

Jurisdiction/Powers of Department
The powers and duties of the State Engineer are listed in N.R.S. § 535.010, and include the following:
The power to issue permits to appropriate, store, and use water to be impounded by a dam proposed for construction; the power to approve or disapprove plans and specifications for the construction of dams of jurisdictional size; the power to inspect or cause to be inspected construction work in progress to determine that such work is being done in accordance with plans and specifications; and the duty to file copies of applications for approval with the state board of fish and game commissioners to ensure conformity with provisions for the installation of fish ways and for the protection of stream wildlife.
The State Engineer may also inspect existing dams, and may require owners to perform such work as necessary to maintain the safety of the dam.
The State Engineer has the right, power, and authority to order the removal of any dam, diversion works or obstruction that have not been legally established on recognized by the state as a valid claim of vested right. N.R.S. § 535.050.
No additional powers relating to the responsibilities of the State Engineer are listed in the dam safety statutes.
Liability and Immunity
No liability clauses are found in the statutes or regulations of Nevada, although N.R.S. § 535.40 states that the performance by the State Engineer of his duties does not constitute a warranty in favor of anyone concerning the water to be impounded or diverted.

Definitions/Dam Classifications
*Dam* means any structure that stores or diverts water for a beneficial purpose. The term includes a dam that is proposed. N.R.S. § 532.120. The term does not include a levee or road embankment that is:

1. Designed as a levee or floodwall intended to constrain the water of a creek or river to its natural floodplain in the event of a flood; or
2. Designed as a levee for the reinforcement of a ditch, watercourse or canal; or
3. Designed for the sole purpose of supporting a roadbed, path or other means of conveyance for the transportation of vehicles, pedestrians, trains or bulk commodities if the levee or embankment:
   a. Is free-draining;
   b. Has a residence time for impounded storm water of less than 24 hours; and
   c. Unless the levee or embankment is less than 10 feet in height, has drainage capacity sufficient to pass, without overtopping, an amount of water equal to the storm runoff generated by a storm whose annual chance of exceedence is 1 percent.

N.A.C. 535.010 specifies that dams for which State approval is required for construction are those which will be 20 or more feet in height or which will impound more than 20 acre-feet of water. Exceptions include dams constructed by the United States Bureau of Reclamation or by the United States Army Corps of Engineers, although such agencies must file duplicate plans and specifications with the State Engineer.

a. **Abandonment:** Not defined; Abandonment process is described under N.A.C. 535.280 and N. 532.120)
   An owner shall not abandon a dam unless, not later than 30 days before he does so, the owner notifies the State Engineer. The notice must include:
   a. The name, mailing address and telephone number of each owner of the dam.
   b. The number of the permit for each water right for the water formerly impounded by the dam.
   c. The location of the dam. The location must be expressed by bearing and distance to a known section corner from a reference point on the dam. The reference point must be on the long axis of the dam at the station where the toe is at the lowest elevation. If no single point meets this criterion, the reference point must be at the intersection of the long axis and the principle outlet centerline of the dam.

b. **Engineer:** “Professional engineer” means a person who by reason of his professional education and practical experience is granted a license by the Board to practice professional engineering. “State Engineer” shall be deemed to mean the State Engineer or any duly authorized assistant.

c. **Hazard Potential:** Not defined.

d. **Operator:** A person, including an owner or his designee, who controls the day-to-day operations of a dam.

e. **Owner:** A person, including a governmental agency or quasi-governmental agency, that:
   1. Causes a dam to be built, rebuilt or modified;
   2. Owns or controls real property on which a dam is constructed;
3. Owns or controls real property inundated by the reservoir created by a dam;
4. Owns a water right that is impounded or diverted by a dam;
5. Is a successor in interest in a chain of title that expressly mentions a dam;
6. Is a local cooperator who will assume any control over a project constructed by the United States Army Corps of Engineers or the United States Bureau of Reclamation; or
7. Is identified by the State Engineer as a person responsible for a dam.

f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: A structure over or through which flood flows are discharged. If the flow is controlled by gates, it is a controlled spillway; if the elevation of the spillway crest is the only control, it is an uncontrolled spillway.

**Hazard Classification**

The State Engineer will assign a hazard classification to each dam. The State Engineer will determine the immediate consequences to persons and property located downstream from the dam in the event of a failure of the dam. The State Engineer will classify a dam as:

(a) *High hazard* if its failure carries a high probability of causing a loss of human life.
(b) *Significant hazard* if its failure carries a:
   (1) Reasonable probability of causing a loss of human life; or
   (2) High probability of causing extensive economic loss or disruption in a lifeline.
(c) *Low hazard* if its failure carries a:
   (1) Very low probability of causing a loss of human life; and
   (2) Reasonable probability of causing little, if any, economic loss or disruption in a lifeline.

If changes in the persons or property located downstream from a dam change the immediate consequences in the event of a failure of the dam, the State Engineer will change the hazard classification of the dam accordingly. The hazard classification of a dam does not constitute a warranty in favor of anyone concerning the actual safety of the dam. N.A.C. 535.140.

**Program Funding**

State Engineer inspection costs are recovered through the water storage fees.

**Fees and Costs**

An annual storage fee of $100.00, plus $1 for each acre-foot storage capacity is assessed to dam owners not later than December 31 of each year. This fee shall include the cost of inspection. The plans and application must be accompanied by a $500 filing fee. There is also a $10 fee to file for proof of completion of work. N.R.S. § 533.435.

Any unpaid balances due to the State for penalty or fee assessment will constitute a lien upon the lands and properties of the person so liable for payment of the bill. N.R.S. § 535.050.

**Permit/Approval Process**

N.R.S. § 535.010 outlines the process of acquiring permits for the appropriation, storage and use of the water to be impounded by a proposed dam. Such permits must be obtained from the State Engineer before construction of the dam begins. When the proposed dam will be of jurisdictional size, plans and specifications must also be submitted to the State Engineer for approval 30 days prior to the start of construction or reconstruction. If the plans are not approved, the State Engineer returns them to the applicant for correction or revision, and construction, reconstruction or alteration may not begin until such plans have been approved.

The Nevada Division of Water Resources publication, Laws and Regulations Pertaining to Dams (1985) describes the steps involved in applying for the water appropriation permit and for the approval of plans and specifications. This publication also contains a sample application for
approval form (along with instructions for completing it), and a sample set of dam plans to which applicants may refer when developing and submitting their own. The instructions for plans specify the size of the drawings and what information should be included on each sheet. Applicants are also given instruction regarding information of particular importance to be included in the specifications. The points highlighted include the clearing of the construction area, stripping, preparation of the foundation, placement of the dam embankment, compaction, and concrete mix.

The provisions section of the publication specifies that a registered engineer must prepare plans and specifications. In addition, general recommendations for spillway design are given, although law designates no specific criteria. N.A.C. 535.210 and 220 provide very detailed criteria for application for construction and decommissioning of water obstructions. N.A.C. 535.230 mandates the State Engineer to approve or deny application within 90 days from receipt, and allows for denied applicants to reapply – after correcting noted deficiencies – within 60 days.

Except as otherwise provided in N.A.C. 535.220, to obtain the approval of the State Engineer pursuant to N.R.S. § 535.010, the plans and specifications must, in addition to all other applicable requirements, demonstrate to the satisfaction of the State Engineer that the dam is able to accommodate an earthquake or other extreme motion event without the failure of the dam or any other unintended release of water. N.A.C. 535.250.

No provisions are made for bond requirements.

The State Engineer must grant approval to impound water, and may grant temporary approval to impound according to the provision and warranting circumstances. N.A.C. 535.300 and 310. The State Engineer may, upon a showing of good cause, grant a variance from any provision of this chapter, including, without limitation, an extension of time to comply with any such provision. N.A.C. § 535.400.

Inspection Process

[State] A dam inspection may be requested of the State Engineer’s office at any time.

N.A.C. 535.360. The State Engineer will inspect or require an owner to inspect:

(a) A dam classified as high hazard not less than once a year;
(b) A dam classified as significant hazard not less than once every 3 years; and
(c) Any other dam not less than once every 5 years.

The State Engineer may at any time inspect, or require an owner to inspect, a dam under construction to determine the condition of any element relevant to the safety of the dam, including, without limitation: the preparation of the foundation; the placement and compaction of the material; the construction of the outlet; armoring; and filling.

The State Engineer will send to the operator:

(a) A copy of each report of a safety inspection;
(b) A list of repairs, if any, that are required; and
(c) A list of repairs or other maintenance, if any, that are recommended.

The State Engineer may require an owner or his designee to:

(a) Submit to the State Engineer a proposed schedule of inspections of the dam and any works appurtenant to the dam;
(b) If the State Engineer approves the inspection schedule, cause the inspections to be conducted;
(c) Maintain records of all inspections and any actions taken to correct any deficiencies identified; and
(d) File with the State Engineer, not later than 30 days after each inspection, a copy of the report of the inspector.
[Owner] The law does not require dam owners to conduct inspections according to a set schedule, however, it does grant the State Engineer power to establish an owner inspection schedule. Owners are obligated to pay for any remedial work necessary to satisfy state safety requirements.

Right of Entry
The State Engineer may enter onto private land for the purposes of administering this section. N.A.C. 535.360

Operation and Maintenance
An operator shall:
(a) Operate and maintain his dam and works appurtenant to his dam in a safe manner and in accordance with all applicable permits, laws and regulations.
(b) Take all necessary action allowed by law to prevent the failure of his dam.
(c) Notify the State Engineer and local responsible authorities of any:
   (1) Problem or unusual event at the dam; or
   (2) Change in the name or address of an operator or owner of the dam, reservoir, shoreline or water right associated with the dam.
(d) Modify his dam to meet changing downstream hazard conditions or upstream watershed modifications. N.A.C. 535.370.

If a dam has multiple owners, each owner must be party to an agreement that allocates responsibility for the maintenance of the dam and regulation of water impounded by the dam among all the owners.
A copy of the current agreement must be maintained in the office of the State Engineer.
The State Engineer will direct communications relating to a dam to the operator. Notice to the operator shall be deemed notice to every owner.

Emergencies/Emergency Action Plan
The necessity for developing and maintaining an Emergency Action Plan (EAP) is directly related to the hazard designation.
The provisions section of the Laws and Regulations booklet describes the powers of the state engineer in the situation in which "the condition of any dam becomes so dangerous to the safety of life and property as not to permit sufficient time for the issuance and enforcement of an order relative to the maintenance or operation" of a dam. These measures (also listed under Powers of the Department) include lowering the water level by releasing water from the reservoir, completely emptying the reservoir, and taking any other steps as may be essential to safeguard life and property. N.R.S. § 535.030.

To obtain an approval to impound, including a temporary approval to impound, an owner or operator must submit to the State Engineer an emergency action plan:
(a) If the dam is classified as high hazard, on or after May 30, 2003, not later than March 31, 2005.

(b) If the dam is classified as significant hazard, on or after March 31, 2005, not later than March 31, 2007.
An emergency action plan must:
(a) Be prepared under the direction of a professional engineer;
(b) Conform to the format specified by the State Engineer;
(c) Include a detailed response for each foreseeable emergency; and
(d) Include one or more inundation maps.
An owner or operator subject to this section shall:
(a) Perform periodic exercises under the plan; and
(b) Modify the plan as necessary to keep it current and incorporate lessons learned from the exercises. N.A.C. 535.320.

**Owner Non-Compliance/Violations/Penalties**
Penalties NRS Section 535.010(8) states: "Any person beginning the construction of any (such) dam before approval of the plans and specifications by the state engineer or without having given the State Engineer 30 days' advance notice of any proposed change, reconstruction or alteration thereof, shall be guilty of a misdemeanor. Each day of violation of this section shall constitute a separate offense and be separately punishable."
A person who violates any provision of this chapter may, depending on the nature of the violation:

1. Be assessed a civil penalty;
2. Be punished pursuant to this chapter; and
3. If the State Engineer orders the removal of the dam, be required to bear the expenses of such removal.

N.A.C. 535.390.
Any unpaid balances due to the State for penalty or fee assessment will constitute a lien upon the lands and properties of the person so liable for payment of the bill. N.R.S. § 535.050.

**Recordkeeping**
The State Engineer shall file all applications for dam construction with the Board of Wildlife Commissioners. This process is to ensure the protection and preservation of fish in streams obstructed by dams. N.R.S. § 535.020.

**Oversight**
All orders and decisions of the State Engineer may be appealed pursuant to N.R.S. § 533.450.

**Miscellaneous**
Nevada Revised Statutes has statutory provisions governing procedures for removal of beaver and dams; maintenance of the normal and natural flow of water in the river within 2 miles of incorporated city or town; unlawful removal, damage, or destruction of pilings, docks, dikes, locks, etc.
An application, correspondence, plan, report or other document submitted to the State Engineer pursuant to this chapter takes effect on the day when a physical copy is received in the office of the State Engineer and is stamped accordingly. N.A.C. 535.420.

a. **Complaints to Unsafe Conditions**
   - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

b. **Environmental Impact**
   - The State Engineer shall file all applications for dam construction with the Board of Wildlife Commissioners for the purpose of protecting and preserving fish in streams affected by dams and other waterway obstructions.

c. **Severability**
   - The dam safety laws and regulations do not specifically address severability.

d. **Supplemental Research Material**
   - "Laws and Regulations Booklet"
   - Various on-line publications and forms available through the State of Nevada, State Engineer website: "Dams and Dam Safety Guidelines"
NEW HAMPSHIRE

Summary
[Pros] Water management and protection authority is granted to all levels of government within the State. The commissioner is authorized to investigate and identify facilities used for storing surplus water. Eminent domain and dam taking are also authorized by the statute, but require a majority vote within the local government or municipality in favor of such action. The development of the Emergency Action Plan involves local emergency management officials and public notice. A “breach analysis” must be performed prior to completion of the EAP for all dams not exempted under the laws; impact upon any downstream dams must be included, as well as flood inundation maps. Owners of existing non-permitted dams must submit an application for permit, along with a fee according to dam classification. There is also an annual registration fee based on dam classification. There is a filing fee of $250 for each statement for permit application. All fees are deposited into the ‘dam maintenance fund’ to be used for the inspection of dams. The department may employ any competent inspector to oversee construction. Dam owners are responsible for maintaining their dams in good condition and repair. The owner of a dam shall incur the expense of examining plans, and inspecting the construction and reconstruction of a dam, including the salaries of regular employees of the department. All sums so received shall be paid to the State, and shall be added to the appropriation available for the use of the department in the employment of experts. Local governments may petition the department to investigate any dam suspected of being in disrepair, when requested to do so by 25 taxpayers of such municipality, and after hearing. Access to a dam or adjacent property may be had at all times by representatives of the department or a municipality. A municipal employee shall supervise the operation of a State-owned dam by a city or town. Administrative penalties are increased dramatically for repeat offenders. Waivers are available upon request to the department. The operation and maintenance provisions require designated dam monitors of Class A dams to be at the dam within 2 hours of heavy rains, and requires operation and maintenance to be in conformance with approved plans. An ‘operation and maintenance plan’ is required for all Class A, B, and C dams. Design criteria regulating plans, specifications, and materials are established in the rules. Permits are valid for 2 years from date of issuance (unless extended by the department); conditions may be attached.

[Cons] Dam abandonment is not addressed. The department has the primary duty to conduct or oversee dam inspections.

Citation and Title
[Rules/Regulations] Regulations are published in Chapter ENV-WR 100 - 800 of the NH Code of Administrative Rules
[Administrative Agency] NH Water Division, Department of Environmental Services, Dam Bureau, Commissioner

Jurisdiction/Powers of Department
N.H.R.S. chapters 481 and 482, grant the Division of Water (“division”) the authority to conserve, regulate and distribute water and to regulate the construction, maintenance and operations of dams. Specifically, Section 1 of Chapter 482 describes the authority of the division with respect to dam operation and maintenance. The division has general authority over the levels of public waters and the manner in which they are controlled. In addition, the division
requires that all existing dams be registered with the State and may order owners to repair or reconstruct dams that are determined to be a menace to public safety. The division must approve the construction of new dams located at the outlet of a great pond (and authorized by the state legislature). The division is responsible for the inspection of dams, and for ordering owners to comply with the requirements of plans and specifications and to develop emergency action plans when deemed necessary. Part ENV-WR 103 of the regulations lists the considerable duties of the division, and their statutory citations. Among those listed are: • To construct, maintain, and operate small watershed projects, • To accept, repair, maintain and operate certain dams, • To investigate high and low water levels, • To maintain a current inventory of dams, • To regulate the construction and reconstruction of dams, • To periodically inspect dams, • To make determinations of dams in disrepair and conduct pursuant proceedings, and • To adopt, promulgate and enforce reasonable rules and regulations.

A public corporation called the NH water resources council is established to oversee water management and protection of state waters. N.H.R.S. § 481:4. A Water Resources Committee is also established under these rules to study water resources in the State and report findings and proposed legislation to the state. N.H.R.S. § 481:1-b.

The department is authorized to call a conference of dam owners to obtain cooperation in the management of stream flow. N.H.R.S. § 482:4.

Municipalities considering the taking of any dam must be authorized to do so by a majority of all voters present at eminent domain proceedings, or by 2/3 vote of all elected members of the town council. N.H.R.S. § 482:65. The department must be petitioned prior to any taking actions; owners must be notified. N.H.R.S. § 482:67, 68.

A municipality, acting through its local legislative body, may employ engineers, counsel, and others. N.H.R.S. § 482:73.

A municipal employee, who shall be designated by the department to act as its agent, shall supervise the operation of a state-owned dam by a city or town. N.H.R.S. § 482:88.

The department may confer and agree with legally constituted similar authorities of other states or agencies of the federal government. N.H.R.S. § 482:90.

Liability and Immunity

The department is liable to suit in the same manner as a private corporation. N.H.R.S. § 481:6-b. Municipalities may also be found liable for damages. N.H.R.S. § 2:72.

Granting of a permit by the department does not relieve dam owners of other duties to ensure the public safety and preserve the water rights of others. N.H.R.S. § 482:8.

Dam owners must maintain and repair the dam so that it shall not become in disrepair, and shall develop and emergency action plan for any dam which may threaten life or property. N.H.R.S. 481:11-a.

Definitions/Dam Classifications

Chapter 482 defines the term dam as "any artificial barrier, including appurtenant works, which impounds or diverts water, and which has a height of 4 feet or more, or a storage capacity of 2 acre-feet or more, or is located at the outlet of a great pond." ENV-WR 101, contains definitions for the terms great pond, which is a "waterbody of more than 10 acres in its natural condition", and height of dam, which means the "vertical distance from the lowest point of natural ground on the downstream side of the dam to the highest part of the dam which would impound water." The Division of Water classifies structures into the following hazard classifications Class AA - a dam that, if it were to fail, would not be a menace to public safety, Class A - a low hazard potential dam, Class B - a significant hazard potential dam, Class C - a high hazard potential dam. The determination of hazard classification of structures is based on the potential threat to life and extent of property damage, and is further explained in ENV-WR 101.03-101.06.
a. **Abandonment:** Not defined.
b. **Engineer:** Must have a minimum of 5 years of engineering experience related to construction inspection or design of similar dam construction projects.
c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** The person or persons who own the dam.
f. **Person:** Any individual, partnership, association, corporation, company, organization, or legal entity of any kind.
g. **Repairs:** Work on a dam that does not change the height, length or discharge capacity of the structure and that does not constitute reconstruction.
h. **Spillway:** Not defined.

**Program Funding**
Except as agreed to bondholders, any surplus revenues from State projects shall be paid into the State Treasury. The commissioner is authorized to borrow money to engage in water management and protection projects. N.H.R.S. § 481:3.
The fees collected for permit application, annual registration, and classification shall be deposited into the ‘damn maintenance fund’ to be used for dam inspections. N.H.R.S. § 482:8-a, 9.
The expense of examining plans, and inspecting the construction and reconstruction of a dam, including the salaries of regular employees of the department shall be paid to the department by the owner of the dam with which it is incurred. All sums so received shall be paid to the State, and shall be added to the appropriation available for the use of the department in the employment of experts. N.H.R.S. § 482:16.

**Fees and Costs**
New regulations/statutes establish a registration fee for dams, to be paid by owners every year in accordance with N.H.R.S. § 482:8-a. The fees range from $100 to $600 depending on dam size/classification.
Owners of non-permitted existing dams shall submit an application for permit for said dam to the department, along with a “classification fee” as follows: Class A dams-$100; Class B dams-$250; Class C dams-$500. N.H.R.S. § 482:5.
The fee for preliminary filing is $250 per application. The division shall then determine whether the proposed structure would be a menace to public safety if improperly constructed, and notify the owner that plans and specifications are to be submitted. Total fees for the process and review of plans and specifications are as follows:
- Non-Menace Structures $250
- Class A Dams $500
- Class B Dams $1000
- Class C Dams $1250

**Permit/Approval Process**
Existing dams must be registered with the division according to the provisions of N.H.R.S. § 482:5 and 482:6, and ENV-WR 302 and 303. N.H.R.S. § 482:9-11, contains statutory provisions relating to the erection of new dams. Persons must file a statement with the division of before the start of construction.
The division may designate an inspector to inspect construction or reconstruction and to report any non-compliance with filed plans and specifications. N.H.R.S. § 821:10. The division may order owners to correct any defects caused by non-compliance, and failure to comply with any such orders can result in an order to cease construction. N.H.R.S. § 482:16 provides that the expenses incurred by the State in examining plans and specifications, including the salary of division employees conducting such examinations, shall be paid to the state by the dam owner.
Regulations pertaining to the permit/approval process are contained in ENV-WR 305, and include information on the following procedures:

- Applications
- Pre-construction inspections and classification assignment
- Notification to owner of application status
- Review of submitted plans, specifications and reports by the division's engineering staff
- Issuance of division order authorizing construction or reconstruction
- Responsibilities of the dam owner

ENV-WR 304 and 306 contain special application procedures for the construction or reconstruction of dams on great ponds, and of milldams. ENV-WR 307 contains dam design requirements for non-menace structures and Class A, B and C structures. These include general requirements, minimum discharge requirements, hydrologic investigations, hydraulic determinations, and design criteria for concrete, steel, timber and earth embankments. Permits are valid for 2 years from date of issuance (unless extended by the department); conditions may be attached. ENV-WR 404.03. Design criteria may not be changed without department authorization. ENV-WR 404.05.

There is a public notification process required before any dam may be breached or removed. N.H.R.S. § 482:13. Person affected by strict application of these rules may request a waiver of rules or portions thereof. ENV-WR 202.

Transfer of ownership is addressed in ENV-WR 303.08. There are set forth minimum design requirements for all dams, and specific criteria for dams according to hazard classification. ENV-WR 403.03.

As-built drawings must be submitted to the department within 180 days of submittal of the affidavit of compliance, which shall be submitted within 10 days of completing the project to demonstrate compliance with approved plans, specifications, and permit. ENV-WR 405. Lake level investigations may be requested. ENV-WR 700.

**Inspection Process**

It is the department’s duty to cause all dams that may be a menace to public safety to be inspected by competent engineers. N.H.R.S. § 481:12. The department also has the duty to inspect dams periodically (ENV-WR 102.21), and within 30 days of receipt of any application for permit. ENV-WR 304.02.

N.H.R.S. § 482:12-15 contains statutory provisions relating to the inspection of dams in the state. The division inspects all potentially hazardous dams every 6 years for Class A dams, every 4 years for Class B dams, every 2 years for Class C dams, and upon written request by any resident if the dam threatens the health and safety of the public. Expenses incurred by the State in carrying out its duty to inspect such structures are collected from the dam owner according to N.H.R.S. § 482:16.

ENV-WR 500 describes the dam inspection program in detail. These regulations include information on the requirements for pre-construction inspections (conducted by division staff, and used to determine the hazard potential classification), construction inspections (conducted by a professional registered engineer provided by the owner, and include materials testing, reports and affidavits), and inspections prior to filling (final visual inspections by the division staff before issuing certificate of approval).

In addition, the State conducts its regular schedule of inspections for existing dams and maintains state and national inventory data. ENV-WR 504 outlines the process involved in implementing inspection findings. The division first determines whether or not a classification change is called for, and what repairs are needed. Then the dam owner is notified of the findings and is given an amount of time in which to complete repairs. Owners are entitled to a public hearing on the matter, or may waive their right to a hearing if there is agreement on the division's determination.
Hearings are conducted in accordance with the provisions of ENV- C 200. Owners may request extensions of time limits if needed, and may opt to remove or breach the structure so that it will no longer impound water, rather than performing the needed repairs. Part ENV-WR 504.08. Local governments may petition the department to investigate any dam suspected of being in disrepair, when requested to do so by 25 taxpayers of such municipality. Dam owners shall be notified of such petition for inspection, and the department shall schedule a hearing, notifying the affected owner at least 21 days in advance. N.H.R.S. § 482:60, 61.

Right of Entry
Access to a dam and adjacent property may be had at all times by representatives of the department or a municipality to implement the purposes and intent of these rules. N.H.R.S. § 482:74.

Operation and Maintenance
Dam owners are required to make any repairs, at owner expense, noted during inspection by the department or other inspector. ENV-WR 302.03. Owners of Class A, B, or C dams shall monitor the dam. This includes a designated employee trained in the operation of the dam and emergency procedures to be available at the dam within 2 hours at all times, and within 2 hours during periods of heavy rain for Class A dams. Dam owners shall also establish a communication system between the dam monitor and the local communities, and the means to conduct emergency repairs on-site. ENV-WR 303.04.
An Operation and Maintenance Plan is required for Class A,B, and C dams and must be submitted to the department for approval. This plan shall describe regular maintenance activities, identify the dam monitors, and identify seasonal control of impoundment levels. The owner shall operate and maintain the dam in accordance with this plan, which must be updated within 15 days of any changes in information. ENV-WR 303.05. Dam monitor information must be provided to the department. ENV-WR 505.09. The department must authorize dam breaching. ENV-WR 303.09. The department also regulates dam removal. ENV-WR 602.

Emergencies/Emergency Action Plans
N.H.R.S. § 482:4 provides that "[w]henever in the opinion of the division of water resources an emergency exists or is threatened whereby the public health or safety may be jeopardized by the release or withholding of stored waters, it shall direct such action by the owner or manager of a dam with respect to the release or withholding of water as it may deem necessary in the public interest."
In addition, ENV-WR 305.03 allows owners to make emergency repairs without prior approval from the water resources board, as long as notification is submitted within 48 hours of the initiation of such repairs. Emergency action plans are to be prepared for all Class B and C dams, and must be prepared in accordance with the provisions of ENV-WR 505. Guidelines for the Development of an Emergency Action Plan, and include contents, public notification and distribution, identification of dam monitors, emergency process review, and other appropriate documentation. The EAP shall be developed in consultation from local officials and notification of the plan shall be given to the general public who would be affected by dam failure. The EAP must be kept on file with the local emergency management director and other local officials deemed appropriate by the department. N.H.R.S. § 482:2.
A “breach analysis” must be performed prior to completion of the EAP for all dams not exempted under the laws. ENV-WR 502.
Owner Non-Compliance/Violations/Penalties
Penalties and injunctions shall be in accordance with N.H.R.S § 482:14 and 482:15. Persons found to be in violation of division orders are guilty of a criminal offense, and may be liable in an action commenced in the name of the State for a civil forfeiture of $100 per day of non-compliance. After notice and hearing, the department may impose an administrative fine upon persistent violators not to exceed $2,000 for each offense in addition to other remedies and penalties. N.H.R.S. § 482:89. Owners may request for time extensions to comply with department directives, which shall be granted if the owner in good faith is unable to comply. ENV-WR 303.13.

Recordkeeping
Recordkeeping is discussed throughout the various sections of the law and regulations.

Oversight
N.H.R.S. § 482:14 provides that orders of the division are subject to appeal, but are to remain in effect until modified or set aside on appeal. ENV-C 200 sets forth in detail the process of appeal of division orders. These include provisions for general rules, rules governing appearances before the division, the computation of time, rulemaking, petitions, motions and replies, consolidation and severance of issues, format for proceedings, and decisions. Any party aggrieved by an order of the department awarding damages may petition the court with jurisdiction to review the assessment. N.H.R.S. § 482:70.

Miscellaneous
Under N.H.R.S. § 482:1 to 482:44 and 482:47, the State may acquire real property rights and easements, including dams in disrepair for the purpose of water conservation and control, stream clearance and channel improvement. This action must be authorized by an act of the Legislature. The State is also authorized by law to construct and maintain dams, and to enter into agreements with individuals, or private or municipal corporations with respect to the acquisition, construction, maintenance or operation of such facilities. N.H.R.S. § 482:58 to 482:73 deals specifically with the process involved in the taking of a dam in disrepair by a municipality. A town may, by eminent domain proceedings before the division, take a dam from an owner who fails to comply with orders to repair or reconstruct within the time allowed. Eminent domain proceedings may be taken only after authorization from resident voters present and voting at a town meeting. There is a judicial review process to ensure that any users of water who benefit from a water management project properly compensate the party responsible for such benefits. N.H.R.S. § 481:9.

a. Complaints to Unsafe Conditions
- The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

b. Environmental Impact
- Enhancement of ecological values is a policy declaration of the water management statute. N.H.R.S. § 481.

c. Severability
- The dam safety laws and regulations do not specifically address severability.

d. Supplemental Reference Materials
- The laws and regulations do not specifically address supplemental reference materials.
NEW JERSEY

Summary
[Pros] Well organized and comprehensive regulations, which set forth procedures for application to construct, repair or modify a dam, set standards for design and maintenance of dams, and establish a dam inspection procedure. In addition, the regulations set forth the procedure to remove or breach a dam. The applicant seeking to remove or breach a dam shall submit: a design report, and plans and computations to effect the breach including size of breach, shape of breach, and disposal of spoil material; computation for design of the method and timing for dewatering the lake; computations detailing the effects of the breach on the downstream channel; specifications containing the technical provision which describe in detail the proposed work methods and equipment; a work schedule for the project; a plan of the existing dam along with surrounding property lines; evidence that surrounding property owners have received notice that an application to remove or breach a dam has been submitted; a description of the potential effects of the dam removal or breach upon the environment; and a description of the potential effects of the dam removal or breach upon life and property downstream. N.J.A.C. § 7:20-1.7(h). The Department of Environmental Protection has the discretion to change the hazard class of any proposed or existing dam. The regulations provide strict guidelines for spillway capacity/safe spillway design flood. Owners of Class I and II dams must submit an Emergency Action Plan with permit applications. The EAPs must include a Dam Breach Analysis, Inundation Maps, and Emergency Notification and Evacuation Plans. The Department established a dedicated, nonlapsing fund, the “Dam, Lake and Stream Project Fund. Money in the fund is used for the purpose of supplementing the department’s capital construction programs that provide funding for dam restoration and repair, lake dredging and restoration, and stream cleaning and desnagging, and to fund the cost of dam inspection. The “Surplus Revenue Fund” appropriates the sum of $6,730,000, to the “Dam, Lake and Stream Project Fund.” N.J. Stat. § 58-4-12. On or before October 1 of each year, the Department submits a written report to the Joint Budget Oversight Committee, or its successor, specifying the nature and location of each project to which funds appropriated under this act shall have been allocated during the preceding State fiscal year; for each project, the names of individuals, groups and political subdivisions to which the funds so allocated shall have been awarded; the amount awarded to each recipient; whether such amount shall have been awarded as a grant or loan; and in the case of each loan, the terms thereof. N.J. Stat § 58:4-12.

[Cons] No mention of fees.

Citation and Title
[Statute] N.J. Stat. § 58:4-1 to 4-14
[Administrative Agency] Department of Environmental Protection, Division of Engineering and Construction, Dam Safety Section.

Jurisdiction/Powers of Department
Title 58, Chapter 4 of the NJ Revised Statutes empowers the Commissioner of Environmental Protection to establish a dam inspection program and to require permits for the construction of dams. The Commissioner is also responsible by law for determining what information is pertinent and necessary for such construction applications, may take action to remove a dam if it is found to be unsafe, may direct the enforcement proceedings against owners failing to comply with orders, and may employ inspection personnel. Powers and duties of the Department of Environmental Protection are also detailed in N.J.A.C. 7:20-1, which includes regulations relating
to the permit process, emergency procedures, permit denials and the appeals process, environmental impact statements, approval of construction plans and specifications (and changes therein), construction inspections, revocation of permits, and dam operating requirements and inspections. The Department also has the discretion to change the hazard class of any proposed or existing dam. The Commissioner, upon finding that a person has violated the Safe Dam Act or any rule, regulation or order, may: (1) issue an order requiring any such person to comply in accordance with subsection b. f this section; or (2) bring a civil action in accordance with subsection e. of this section; or (3) levy a civil administrative penalty in accordance with subsection d. of this of this section; or (4) bring an action for a civil penalty in accordance with subsection e. of this section; or (5) petition the attorney general to bring a criminal action in accordance with subsection f. of this section. All penalties collected pursuant to N.J. Stat. § 58:4-5 shall be deposited in the “Environmental Services Fund,” established pursuant to section 5 of P.L. 1975, c. 232 (C. 13:1D-33), and kept separate from other receipts deposited therein, and appropriated to the department for the removal of dams in the state.

**Liability and Immunity**

N.J.A.C 7:20-1.4(f) exempts the Department and its agents or employees from action for the recovery of damages stemming from the failure of a dam by virtue of its approval, orders, regulation and inspection, or emergency measures taken.

**Definitions/Dam Classifications**

N.J.A.C. 7:20-1.2 defines dam as "any artificial dike, levee or other barrier, together with appurtenant works, which is constructed for the purpose of impounding water on a permanent or temporary basis, that raises the water level five feet or more above the usual, mean, low water height when measured from the downstream toe-of-dam to the emergency spillway crest or, in the absence of an emergency spillway, the top-of-dam". All dams in the state meeting the criteria set out in the definition are subject to regulation by the Department of Environmental Protection, with the only exception being dams located in the "pinelands" area, which are under the jurisdiction of the Department of Agriculture.

N.J.A.C. 7:20-1.2 defines the term height-of-dam as "the vertical dimension from the lowest point in the original stream bed or natural ground surface at the downstream toe of the dam to the elevation of the top of dam (without camber)."

Guidelines for classifying dams according to hazard are found in N.J.A.C. 7:20-1.8.

- **Class I - High Hazard Potential** - Dams, the failure of which may cause probable loss of life or extensive property damage.
- **Class II - Significant Hazard Potential** - Dams, the failure of which may cause significant damage to property and project operation, but loss of human life is not envisioned.
- **Class III - Low Hazard Potential** - Dams, the failure of which would cause loss of the dam itself but little or no additional damage to other property.
- **Class IV - Small Dams** - Any project which impounds less than 15 acre-feet of water, is less than 15 feet in height, and has a drainage area above the dam of less than 150 acres.

  a. **Abandonment**: Not defined.
  b. **Engineer**: Not defined.
  c. **Hazard Potential**: Not defined.
  d. **Operator**: Not defined.
  e. **Owner**: Any person who owns, controls, operates, maintains, manages or proposes to construct a dam.
  f. **Person**: Any individual, proprietorship, partnership, association, corporation, municipality, county or public agency.
  g. **Repairs**: Not defined.
h. **Spillway:** A structure other than low flow outlets, over or through which flood flows are discharged.
   a. **Auxiliary spillway:** the second used spillway during flood flows which is not the emergency spillway.
   b. **Emergency spillway:** the spillway capable of passing the spillway design storm with the principal and/or auxiliary spillway blocked.
   c. **Principal spillway:** the primary or first used spillway during normal inflow and flood flows.
   d. **Spillway design storm:** the storm upon which the hydraulic capacity of the spillway structure is designed.

**Program Funding**

N.J. Stat § 58:4-12, “Dam, Lake and Stream Project Fund.” The Department of Environmental Protection established a dedicated, nonlapsing fund. Moneys in the fund shall be used for the purpose of supplementing the department’s capital construction programs that provide funding for dam restoration and repair, lake dredging and restoration, and stream cleaning and desnagging, and to fund the cost of dam inspection as prescribed under subsection f. of this section. The “Surplus Revenue Fund” appropriates the sum of $6,730,000, to the “Dam, Lake and Stream Project Fund.”

Moneys in the Fund are appropriated for State, local or privately owned projects and may be combined with other State or non-State funding sources. Moneys appropriated from the Fund may be used by the department to provide loans bearing an interest rate of not more than 2% or other forms of assistance, other than full or matching grants, to owners of private dams, lakes or streams, in accordance with criteria for existing programs established under previous State bond acts, legislative initiatives, or federal aid guidelines.

Loans awarded under this section to owners of private dams or lake associations shall require local government units to act as co-applicants. The cost of payment of the principal and interest on these loans shall be assessed, in the same manner as provided for the assessment of local improvements generally under chapter 56 of Title 40 of the Revised Statutes, against the real estate benefited thereby in proportion to and not in excess of the benefits conferred, and such assessment shall bear interest and penalties from the same time and at the same rate as assessments for local improvements in the municipality in which they are imposed, and from the date of confirmation shall be a first and paramount lien upon the real estate assessed to the same extent, and be enforced and collected in the same manner, as assessments for local improvements. Notwithstanding the provisions of any subsection or of any other law to the contrary, no project for which loans to owners of private dams or lake associations are awarded under this section shall be considered a municipal capital improvement, nor shall the amount of any such loan be considered part of the municipal capital budget, and no such loan shall be subject to the review or approval of the Local Finance Board established under P.L. 1974, c. 35 (C. 52:27D-18.1). The moneys appropriated under this section shall be allocated commencing with the fiscal year of enactment in such a manner that (a) the amount allocated to dam restoration and repair shall be $4,730,000 (b) the amount allocated to lake dredging and restoration and to stream cleaning and desnagging shall be $2,000,000 and (c) the amount allocated to the Department of Environmental Protection for repair of department-owned dams shall be $0.00. In addition to the number of individuals employed as inspectors of dams on October 1, 2000, the Department of Environmental Protection is directed to employ nine additional individuals as inspectors of dams and to keep all of the positions, including both those in which individuals were employed as inspectors of dams on October 1, 2000 and those to which the nine additional individuals shall have been appointed thereafter, with employees having educational backgrounds or skills in engineering necessary to conduct the inspection of dams and otherwise to carry out the objectives of this act. The salary costs for the nine additional staff positions shall be charged against the
moneys appropriated under subsection a. of this section and allocated under subparagraph (a) of paragraph (2) of subsection e. hereof.

Fees and Costs
The dam safety laws and regulations do not mention fees.

Permit/Approval Process
New Jersey Revised Statutes prohibits anyone from constructing or operating a new dam, or modifying or repairing an existing dam without first obtaining a permit from the Department of Environmental Protection.
N.J.A.C. Sections 7:20-1.4 through 1.7 explain the permit application and approval process. The process involved in applying for a dam construction, modification or repair permit and for submitting the required engineering documents includes the pre-application stage and the application stage.
General requirements for all permit applications include the following:
Dam construction must commence within one year from the permit date, and shall be completed within two years from such date, unless otherwise approved by the Department or a written request for an extension is submitted prior to the expiration dates.
Permit applicants must use a New Jersey licensed professional engineer to prepare plans and specs and to supervise construction inspections.
The Department may require a dam owner to obtain a permit for repair or modification of a dam which is judged to be unsafe or not in compliance with regulations.
In the pre-application stage applicants are required to submit a Preliminary Report describing the structure and proposed classification, maps of the construction area, a written report of the superficial conditions, typical cross-sections of the dam, preliminary design data, the hydrologic design procedure, and documentation relating to the determination of the hazard classification.
Upon review of the pre-application, the Department notifies the applicant which design criteria will apply.
N.J.A.C. 7:20-1.7 lists the requirements for the application stage of the permit process. Generally, the application consists of forms specified and supplied by the Department, two copies of the final design report and construction specifications, and five sets of plans, drawings and design specifications. Details to be included in the Final Design Report, the required drawings, cross-sections, and specifications are found in N.J.A.C. 7:20-1.7, as well as provisions relating to emergency action plans, and environmental impact statements.
Spillway design criteria are set forth in N.J.A.C. 7:20-1.9, and are based on the following requirements: [Hazard Spillway Design Storm]
Class I PMP
Class II One-Half PMP
Class III 24 Hr. 100-Year Frequency - Type II Storm
Class IV 24 Hr. 100 Year Frequency - Type II Storm plus 50%
N.J.A.C. § 7:20-1.5(d) sets forth that an applicant for a dam permit may request in writing an administrative hearing from the Department within 15 days of receipt of the decision by the Department to deny the application. The Department may attempt to settle the dispute by conducting such proceedings, meetings and conferences as deemed appropriate. If efforts to settle fail, the Department shall forward the request for a hearing to the Office of the Administrative Law.

Inspection Process
N.J.A.C. Section 7:20-1.10 describes the requirements relating to supervision of dam construction, which include Department approval of the extent and method of inspection for construction quality control, and an inspection schedule. The owner must report the number of
inspectors designated for construction quality, and the professional engineer responsible for such inspections must submit monthly progress reports during construction. Department responsibilities include post-construction inspections to assure that work has been completed in accordance with approved design, plans and specifications. The Department also has the authority to inspect construction at any time during the progress of the work, and may order immediate compliance with designs, plans and specifications if construction is found not to be in compliance. Dam operating requirements and inspections for new and existing dams are found in N.J.A.C. Section 7:20-1.11. (Statutory authority for the inspection program and requirements is provided in R.S. Title 58, Chapter 4.) The regulation spells out the inspection schedule for regular, informal, and formal inspections for small and large dams in each county of the state. All formal and regular inspections must be performed by a licensed New Jersey professional engineer, and attended by a professional engineer assigned from the Department. Most informal inspections may be performed by the owner or operator. Inspectors/owners must submit a Report of Condition, prepared under Department guidelines, within 30 days following each inspection. The owners and operators of all dams which raise the waters of any stream more than 70 feet above its usual mean low-water height or which impound more than 10,000 acre-feet of water shall have a regular inspection performed annually and formal inspections performed every three years by a N.J. licensed professional engineer. Owners of Class I dams shall have a regular inspection performed once every two years and a formal inspection performed every six years. Owner of Class II dams shall have a regular inspection performed once every two years and a formal inspection performed every 10 years. Owners of Class III and IV dams shall have a regular inspection performed every four years. All dam inspections shall be performed between March and December. The Department may order the owner or operator of any dam to conduct an inspection, and failure to conduct required inspections or submit Reports of Condition within time limits may result in a Department order to drain the impoundment.

Right of Entry
The Commissioner is also given the specific right of entry upon any property for the purpose of obtaining information about the safety and proper maintenance of dams or reservoirs. N.J. Stat. § 58:4-5.

Operation and Maintenance
The owners and operators of all dams shall develop and use an Operation and Maintenance Manual, which provides guidance and instruction to project personnel for the proper operation and maintenance of the reservoir and dam. The manual shall be composed of two parts. Part one shall include an introduction, project description, project authorization, project history and list of project contracts. Part two shall contain the operation and maintenance instructions for major project facilities and equipment and a schedule for maintenance. N.J.A.C. 7:20-1.3(b) states that the Department may, in its discretion, require the owner or operator of any dam to make modification of the design, construction or operation of the dam in order to comply with the intent of this chapter. The owner or operator, upon the detection of any condition which may jeopardize the safety of the structure, shall notify the Department immediately.

Emergencies/Emergency Action Plans
Procedures to be followed in situations threatening the public health, safety and welfare are outlined in N.J.A.C. 7:20-1.4(i). Owners/operators must notify the Department by telephone of the emergency situation and describe the proposed repair work. Upon verbal approval of the Department, emergency work shall commence, under the guidelines and instruction of the Department. The Department must verify in writing the approval of repairs, and shall issue a
letter in lieu of a permit upon the receipt of a dam permit application and "as built" drawings. N.J.A.C. 7:20-1.7(f) requires applicants for Class I and II dams to submit an Emergency Action Plan with permit applications. The EAP must include a Dam Breach Analysis, Inundation Maps, and Emergency Notification and Evacuation Plans.

**Owner Non-Compliance/Violations/Penalties**
N.J. Stat. §58:4 authorizes the Commissioner of the Department to direct with the Attorney General proceedings in court for the enforcement of any order issued under the provisions of the Dam Safety Act. Persons found to be in violation of Chapter 4 or of any order issued pursuant to it are liable to a penalty of not more than $5000.00 for each offense, or, for continuing violation, $5000.00 for each day of violation. Persons constructing dams not in accordance with approved design, plans and specifications, and who fail to comply with Department orders to such effect, may have construction permits revoked or suspended by the Department. N.J.A.C. 7:20-1.10 (b).

**Recordkeeping**
The dam safety laws and regulations do not specifically address recordkeeping.

**Oversight**
Provisions for the appeal of decisions denying the application for a dam permit are outlined in N.J.A.C. 7:20-1.5(d). Applicants must request an administrative hearing from the Department within 15 days of the receipt of the decision to deny the application. The Department may then attempt to settle the dispute, but if unsuccessful, the hearing request is forwarded to the Office of Administrative Law for action.

**Miscellaneous**
1. Special provisions apply to the construction and maintenance of dams and reservoirs in the "pinelands" areas of the state. These areas come under the authority and jurisdiction of the Department of Agriculture.
2. The Safe Dam Act provides that property owners who have made permanent improvements to the land above a long-standing dam or along its reservoir may petition to prevent dam operators from removing or abandoning the dam or significantly lowering the water level except for repairs. If the cost of maintaining the dam is determined to be an undue burden on the owner or operator, the Commissioner may negotiate with the petitioning landowners to pay a part of the maintenance expenses.
   a. **Complaints to Unsafe Conditions**
      - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.
   b. **Environmental Impact**
      - The Department may require the submission of an Environmental Impact Statement by any applicant for a dam permit.
   c. **Severability**
      - The dam safety laws and regulations do not specifically address severability.
   d. **Supplemental Reference Material**
      - The dam safety laws and regulations do not specifically address supplemental reference materials.
NEW MEXICO

Summary
[Pros] The regulations were last updated March 31, 2005. The statute begins with appropriation of water rights and benefits of usage. The State Engineer is required by law to inspect, or cause to be inspected, any completed construction to determine the actual capacity, safety and efficiency before issuing a certificate of construction. Fees for State Engineer inspections shall be paid by the owner, or placed as a lien against the owner’s property. The State Engineer, if deemed necessary to the public safety, may bring in consulting engineers, geologists, or other expert consultants, with compensation to be paid by the owner of the permit. After construction – found to be satisfactory with the permit conditions upon inspection – the State Engineer shall issue a certificate of construction. Approved construction works must be completed by a prescribed date; extensions to complete construction may be granted at the State Engineer’s discretion. The regulations differentiate ‘jurisdictional dams’, which are regulated by the state engineer, and ‘non-jurisdictional dams’ which do not meet the minimum size requirements and are not regulated by the state engineer unless the dam is unsafe and there is a threat to life or property. The fee schedule is comprehensive, and is based in part on estimated construction costs of a proposed project. A water right is required for water impounded by the dam. The regulations set forth very extensive, detailed permit application criteria, including inundation maps, topographical information, geologic studies, potential for foreseeable development downstream, spillway design, and damage assessment. The following plans are required for dams classified as ‘high’ or significant’ hazard potential: operation and maintenance plan, emergency action plan, dam site security, and an instrumentation/monitoring plan. The certificates (Engineer’s Certificate, Surveyor’s Certificate, State Office of Emergency Management Certificate, and Dam Owner’s Certificate acknowledging compliance with applicable dam safety laws are included in the regulations. Dam owners are required to obtain a license from the State Engineer – after a successful approval process – to operate a dam. If a dam incident occurs at a dam, the dam owners shall report the incident to the state engineer within 72 hours. Owners of low or significant hazard dams must revaluate the dam hazard classification if downstream development occurs, and must notify the state engineer. Right of entry shall be granted to the State Engineer upon notice to the owner. Dam safety program funding is not addressed in these laws. The statute allows dam owners approximately 3 ½ years to implement their emergency action plan, though a schedule for compliance must be submitted within 9 months.
[Cons] Responsibility for inspections lies primarily with the State Engineer. Should it be required by the State, or opted by the owner, the owner is responsible for securing the services of a professional engineer, who shall inspect dams and submit reports to the State Engineer. High or significant hazard dams need only be inspected at least once every 5 years. The owner non-compliance provisions could be strengthened.

Citation and Title
[Statute] New Mexico Statutes Annotated (N.M.S.), Chapter 72. Water Law, Article 5. Appropriation and Use of Water
[Administrative Agency] New Mexico Office of the State Engineer, Dam Safety Bureau, State Engineer

Appendix E 156 New Mexico
**Jurisdiction/Powers of Department**

Jurisdiction over the design and construction of non-federal dams lies with the New Mexico State Engineer, whose authority is contained in N.M.S. § 72. According to the Manual of Rules and Regulations, the State Engineer has the right and duty of supervision of the apportionment of water, and is empowered to make rules and regulations necessary to administer these duties. The State Engineer is responsible for reviewing and accepting or denying applications for water rights, including the construction of dams.

Other powers and duties include determining the form and substance of field surveys, maps and plans required for each construction project, returning Formal Applications, plans and specifications to the applicant for corrections if found to be defective or infeasible, establishing fees, requiring proof of publication of public notice of application to construct, conducting hearings on protested applications, conducting inspections during dam construction (and issuing orders requiring correction and/or limiting use of the dam if deficiencies are found), issuing Certificates of Construction certifying the location, capacity and adequacy of the works, and conducting final inspections before issuing a license to appropriate water.

The State Engineer, if deemed necessary to the public safety, may bring in consulting engineers, geologists, or other expert consultants, with compensation to be paid by the owner of the permit. N.M.S. § 72-5-9.

The regulations differentiate ‘jurisdictional dams’, which are regulated by the State Engineer, and ‘non-jurisdictional dams’ which do not meet the minimum size requirements and are not regulated by the State Engineer unless the dam is unsafe and there is a threat to life or property. Rule 19.25.12.

**Liability and Immunity**

N.M.S. § 72-5-11 states, "[n]othing in this section and no action or failure to act under this section shall be construed to create any liability in the State or its officers or employees for the recovery of damages caused by such action or failure to act." The law further places sole responsibility for legal duties, obligations and liabilities incident to ownership or water impoundment on the owner or operator.

**Definitions/Dam Classifications**

New Mexico water law applies to dams constructed to impound the public waters of the State for any purpose, and generally to structures which are more than 10 feet in height or are capable of impounding more than 10 acre-feet of water. N.M.S. § 72-5-32.

*Dam height* is measured from the lowest natural ground surface elevation to the crest of the dam. Federal dams are generally exempt, and special provisions are made for stock dams and erosion control dams.

*Dam* is defined as a man-made barrier constructed across a watercourse or off-channel for the purpose of storage, control or diversion of water.
Owners of low or significant hazard dams shall evaluate the hazard potential if downstream development occurs, and shall submit the results to the State Engineer for approval. If the hazard potential changes due to such development, the State Engineer shall give the dam owner a time limit to address any deficiencies. Rule 19.25.12.21.

a. Abandonment: Not defined.
b. Engineer: A professional engineer licensed in the State qualified in the design and construction of dams.
c. Hazard Potential: The ‘hazard potential classification’ shall be based on the dam failure condition that results in the greatest potential for loss of life or property damage.
d. Operator: Not defined.
e. Owner: The individual, association or corporation, public or private, the state or the United States, owning the land upon which a dam is constructed; having a contractual right to construct, operate or maintain a dam; or the beneficiary of an easement to construct, operate or maintain a dam.
f. Person: Not defined.
g. Repairs (Alteration, modification, repair, rehabilitation, or enlargement of existing dams): To change from the State Engineer accepted construction drawings and specifications or current condition.
h. Spillway: A structure over or through which excess flow is discharged from a reservoir. If the rate of flow is controlled by mechanical means, such as gates, it is considered a ‘controlled spillway’. If the geometry of the spillway is the only control, it is considered an ‘uncontrolled spillway’.

Program Funding
The dam safety laws and rules do not address program funding.

Fees and Costs
Fees for State Engineer inspections shall be paid by the owner, or placed as a lien against the owner’s property. N.M.S. § 72-5-11.
Rule 19.25.12.8, lists the fees charged for various aspects of the appropriation and use of surface waters:
• For filing notice of intention to make formal application for permit to construct or operate a dam, $25.00 (permit transfer carries a $5 fee).
• For examining the plans and specifications in connection with an application, $2.00 per $1000 of estimated cost of the dam.
• For issuing a certificate of construction or license to appropriate, $25.00.
• For issuing a permit for extension of time, $50.00.
• For inspecting construction work, $100/8-hour day plus actual and necessary travel expenses.

Permit/Approval Process
Rule 19.25.12.13 and N.M.S. § 72 require that a State-approved, registered professional engineer be appointed to supervise the construction of works for storage, diversion or carriage of water. Filing, approval and construction schedules and requirements pertain significantly to water rights, and are summarized as follows:
1. A Formal Application is filed following guidelines for safety and criteria for seismic design and evaluation and spillway design. The State Engineer office must approve design before construction can begin, and hydrologic evaluation guidelines and PMP criteria are used. The State also provides detailed guidelines for the seismic design and evaluation of dams. Spillways are to be designed and sized in accordance with criteria set forth in USDA Technical Release No. 60, June 1976 (revised Oct. 1985). The guidelines are summarized in the New Mexico Dam Safety Design Criteria publication.
2. All requirements for filing are subject to the State Engineer's discretion on a case-by-case basis, depending on the size and complexity of the project. General requirements must follow guidelines listed in the regulations. A registered professional engineer must complete all field surveys. Dam breach analysis, and specific design criteria are set forth in section 19.25.12.11 of the regulations.
3. It is the applicant's responsibility to see that the Notice of Publication, issued by the State Engineer, appears in area newspapers and that an affidavit of Proof of Publication is filed in accordance with state regulations.
4. A protest period of 10 days follows the last date of publication, during which protests may be filed with the state engineer. Hearings may be ordered, at the discretion of the State Engineer. Procedures and requirements for hearings are set out in the Rules and Regulations.
5. The State Engineer, upon approval of an application, sets time limits for construction and application of water to beneficial use, and may alter them as necessary relative to proof that the project will be completed. An approved application is a permit to appropriate water and apply such to beneficial use.
6. Upon completion of construction, the State Engineer, or his appointee makes a thorough inspection, and the permittee files on proper forms a Proof of Completion of Works.
7. The State Engineer issues a Certificate of Construction indicating the point of diversion, capacities of reservoirs and also certifies the adequacy of the works for the intended use.
8. As soon as possible after completion, the permittee shall divert water and apply it to its intended use, and shall file a Proof of Application of Water to Beneficial Use, fully describing the uses made, quantity used, and if appropriate, the amount and description of land irrigated.
9. The State Engineer makes a final inspection and files a report containing recommendations of water use, legal subdivision and acreage of land irrigated, and amount of water applied. Following this, the State Engineer issues a license to appropriate water, which defines the extent and conditions of use under which the water right is granted.

The State Engineer may, in the best interests of the development of the State, grant extensions of time in which to complete construction of approved works upon proper showing by the applicant of due diligence or reasonable cause for delay. N.M.S. § 72-5-14.
Waivers of regulations, or portions thereof, shall be granted at the discretion of the State Engineer Rule 19.25.12.11.

Incremental damage assessment, outlet works design and operation, geological assessment, geotechnical investigation, stability analysis, seismic design and analysis, pseudostatic analysis, material evaluations, dam geometry, freeboard size, erosion (protection), structural design, and spillway capacity requirements are set forth in the regulations. Rule 19.25.12.11. The exhaustive regulations also establish criteria for construction drawings; quality, size, sheet numbers, engineer seal and signature, orientation and date, title sheet, scale, contents, vicinity map, site topography, design detail, reservoir area and capacity, point of outlet, and permanent bench mark.

The specifications shall describe the project, work to be done and materials to be used during proposed works. Dam site security, instrumentation/monitoring plans, an operation and maintenance manual, and emergency action plan are also required for permit approval. Rule 19.25.12.11.


Removal or breach of dams is regulated under Rule 19.25.12.19. Dam owners intending to breach or remove a dam must first obtain department approval, ensuring that the reservoir is emptied in a controlled manner, which will not endanger lives or damage property. The State Engineer will revoke the license to operate the dam upon completion of permitted removal/breaching procedures. Rule 19.25.12.19.

Owners proposing to reconstruct, enlarge or modify existing non-jurisdictional dams, resulting in a jurisdictional dam after construction must comply with the permit approval provisions. Rule 19.25.12.19.

**Inspection Process**

The State Engineer is required by law to inspect, or cause to be inspected, any completed construction to determine the actual capacity, safety and efficiency before issuing a certificate of construction. N.M.S. § 72-5-9. If the project is not found to be properly and safely constructed, the State Engineer may require that corrections be made within a specified time period, may postpone certification until corrections are made, and/or may bring in consulting engineers or geologists. The owner of the permit pays for all corrections and consultant fees.

Completed dams are inspected periodically by the state engineer office on a schedule of every one to five years, depending on the location and hazard classification. Existing dams are investigated and evaluated based on these PMF criteria and, if appropriate, PMP criteria developed by the USDA Soil Conservation Service to determine appropriate spillway designs and capacities.

The owner is required to maintain the dam in safe operating condition, which may require periodic inspections at their request. Such inspections may be conducted by the state engineer (at owner’s expense) or by a licensed professional engineer employed by the owner.

If during a regular inspection, deficiencies are found, the State Engineer shall notify the owner and require appropriate remedial work to be done at the owner’s expense. Upon the request of any other party and the deposit of an amount equal to the estimated cost of an inspection, the State Engineer shall inspect the allegedly unsafe works. If they are found to be unsafe, the owner shall pay the cost of the inspection and corrections, and the party originating the request shall be refunded his deposit. N.M.S. § 72-5-11.

**Right of Entry**

Access to the dam site shall be made available to the State Engineer upon request. Rule 19.25.12.19.
Operation and Maintenance
An ‘operation and maintenance manual’ is required for dams classified as high or significant hazard, and must identify the activities necessary to continue safe operation, maintenance and overall performance of the dam. Any restrictions imposed on the dam shall be set forth in this manual. The facility inspection schedule must also be provided in this plan. Rule 19.25.12.11. Dam site security must be addressed for all dams classified as high or significant hazard. If the failure of the dam will result in catastrophic consequences, the State Engineer will require a security and risk management plan for the dam. Rule 19.25.12.11.
An instrumentation plan providing the ability to monitor and evaluate dam performance is required for all dams classified as high or significant hazard. This plan shall detail the description of the instrumentation, readings, maintenance schedules, installation, and special instrumentation or monitoring requirements. Rule 19.25.12.11.

Emergencies/Emergency Action Plans
An ‘emergency action plan’ is required for dams classified as high or significant hazard potential. This plan shall identify potential emergency conditions, a notification flowchart, preparedness provisions, inundation map, and preplanned actions to be followed to minimize property damage and loss of life. Rule 19.25.12.11.
If a dam incident occurs at a dam, the dam owners shall report the incident to the State Engineer within 72 hours. Rule 19.25.12.21.

Owner Non-Compliance/Violations/Penalties
N.M.S. § 72-5-12 describes penalties for owners who, after having been notified of unsafe conditions and the required corrections, fail to take action within the specified time period. Any such owner is guilty of a misdemeanor and may be fined up to $250 for each offense and sentenced to up to six months imprisonment. It is the duty of the State Engineer to notify the appropriate district attorney of such violations.

Recordkeeping
There are reporting and recordkeeping requirements outlined throughout the regulations.

Oversight
Aggrieved parties may challenge an administrative actions or decisions.

Miscellaneous
A large part of New Mexico's rules and regulations deal with water rights, old and new, and definition of the beneficial use of water.

  a. Complaints to Unsafe Conditions
  - Upon the request of any party, accompanied by the estimated cost of inspection, the State Engineer shall cause any alleged unsafe works to be inspected. Founded complaints will prompt return of deposited moneys and expenses paid by the owner (NMSA 72-5-11).
  b. Environmental Impact
  - The dam safety laws and rules do not specifically address environmental impact.
  c. Severability
  - If any portion of this part is found to be invalid, the remaining portion of this part shall remain in force and not be affected (19.25.12.22).
  d. Supplemental Reference Materials
    • Governing the Appropriation and Use of Surface Waters of the State of New Mexico (Manual), last revised in 1987.
• *New Mexico Dam Safety Design Criteria*, last revised in 1999.
NEW YORK

Summary
[Pros] All waterways are regulated by the Department of Environmental Conservation ("department"), which shall determine the whole impact upon such waterways prior to issuing a permit affecting such waterways. New York is very concerned with the protection of their watersheds, evidenced by the extensive “definitions” section addressing hazardous substances, aquifer, and groundwater legislation. Of note, the regulations list the average high water levels for lakes, rivers, and reservoirs in each State drainage basin, providing a crude database from which to reference changing water levels. The statute gives the department the power, after hearing, to order any person or local public corporation to implement a dam safety program, inspect, monitor, maintain, and operate their dam, plan for emergency action, ensure financial security, keep records, report to the department, remove, or repair dams and impoundment structures. Local governments can be exempt if they can demonstrate that their ordinances satisfy the statutory requirements and are enforced. Other structures are regulated through permitting; wharves, docks, moorings are such structures. The factors used to determine dam hazard classification are comprehensive. Dams are also assigned a “condition rating” according to their deficiencies. In addition, some water impounding structures used for propagation of fish (fish ponds) and agriculture are exempt from regulation if within the “exception” parameters. Excavation from and/or placement of fill into any navigable waterway require a permit. All emergency work not requiring pre-approval from the department must be done to minimize environmental impact, or department intervention may occur. Permits are required for any dam construction, alteration, or removal. The department may enter onto any property at any time to conduct inspections, and may request any information to facilitate such inspections. Upon Department judgment, the department may order the dam owner to commence any actions necessary to ensure the safety and integrity of their dam. Department reimbursement works through a unique system involving the county in which the affected dam is located; the department notifies the county, who then recovers any owned fees or penalties from the dam owner in a similar manner to recovering other taxes. New York also makes it unlawful for any subcontractor, employee, or agent of a person, public corporation, or the State to knowingly violate these laws.

[Cons] New York segregates its dam safety regulations into two separate sections: (1) Use and Protection of Waters, and (2) Dam Safety Regulations. Referencing two separate regulations creates a more involved process to determine dam owner rights and requirements. The “Exceptions” provision allows some significant water impoundments to go unregulated, unless presenting a threat to public health, safety, property, or natural resources. 6 NYCRR 673.2 and ECL 15-0503 have different criteria to classify a dam as subject to regulation, creating some ambiguity in determining which structures are regulated, and which are exempt. State exemption from liability is not clearly addressed, nor is it seemingly implied. There are no annual or application fees under these laws. Inspection frequencies are not stated. Operation and maintenance requirements are not clearly outlined.

Citation and Title
Jurisdiction/Powers of Department
The New York State Department of Environmental Conservation is charged with implementation of the Environmental Conservation Law (E.C.L.), which includes dam safety provisions. No persons shall modify any stream or commence dam activities without department permission. The department shall ascertain probable effect on the health, safety, and welfare of the people of the State, and the effect on natural resources of the State before approving the proposed project. Local and State public corporations are exempt from permitting requirements upon previous written agreements with the Department. E.C.L. § 15-0501.
E.C.L. § 15-0503 provides that “no dam shall be erected, constructed, reconstructed, or repaired by any person or local public corporation without a permit issued pursuant to this section.” This section also includes docks, moorings, wharves, platforms or other such structures, unless explicitly exempt from regulation. Local governments may apply for exemptions upon submittal of ordinances that adequately enforced to satisfy the requirements of these laws. The design and preparation of plans and specifications, and supervision of the erection, construction, reconstruction, and repair of all regulated structures shall be done by a licensed professional engineer.
E.C.L. § 15-0507 directs the department to inspect and investigate dams whenever public safety requires. The statute gives the department the power, after hearing, to order any person or local public corporation to implement a dam safety program, inspect, monitor, maintain, and operate their dam, plan for emergency action, ensure financial security, keep records, report to the department, remove, or repair dams and impoundment structures. Upon violation of such an order, the department has the power to enter property to remove or repair the structures and to take additional actions as needed to safeguard life, property, and natural resources. The statute provides for recovery of costs and expenses, incurred in such department action, through the local real property taxing authority.
The Regulation that implements E.C.L. § 15-0507 is C.R.R. 673. C.R.R. 673 is applicable to a dam if any of the following provisions apply (a) its height is equal to or greater than 10 feet; (b) its maximum impoundment capacity is equal to or greater than 1,000,000 gallons (3.07 acre-feet); (c) its drainage area is equal to or greater than one square mile; or (d) it presents a threat to public health, safety, property or natural resources.
It is unlawful for any subcontractor, employee/agent of a person or public corporation, or a State Department to knowingly and intentionally violate the provisions of this law. E.C.L. § 15-0513.
C.R.R. 673 requires a permit for any excavation of or placement of fill in to any navigable waters. E.C.L. § 15-0514 addresses contamination of State groundwater and aquifers.

Liability and Immunity
Nothing in C.R.R. 673, pertaining to department duties relieves the owner from obtaining the necessary permits under C.R.R. 608, or any other State or federal laws.
Section 17 of the Public Officers Law provides for defense and indemnification of state employees in a civil proceeding arising from activities within the scope of the employee's public employment.
Section 19 of the Public Officers law provides for reimbursement of defense costs incurred by or on behalf of state employees in a criminal proceeding arising out of any act which occurred while the employee was acting within the scope of his public employment upon his acquittal or upon dismissal of the criminal charges.

Definitions/Dam Classifications
E.C.L. § 15-0503 states that the permit requirement applies to any dam "provided it has (1) a height equal to or greater than fifteen feet or (2) a maximum impoundment capacity equal to or greater than three million gallons; except that for purposes of this section a dam shall not include any structure which has (i) a height equal to or less than six feet regardless of the structure's
impoundment capacity, or (ii) an impoundment capacity not exceeding one million gallons regardless of the structure's height."

_Dam or impoundment structure_ means any artificial barrier, together with its appurtenant works, that impounds or will impound waters, and includes but is not limited to earth fills, with or without controllable outlet gates, and roads, bridges or fords that unduly impede the flow of water. Lagoons and storage facilities with impoundment structures used for waste storage, treatment, disposal or the containment of materials, other than water, are not subject to regulation pursuant to this Part. C.R.R. 608.

Dam means any artificial barrier, together with its appurtenant works, constructed for the purpose of impounding water. C.R.R. 673.

Hazard classifications are determined by height and maximum impoundment capacity, potential risk to human life, physical characteristics of the dam site, economic loss from dam failure, environmental damage from failure, and other factors considered as necessary by the Department. Dam are defined in C.R.R. 673, as follows:

- **Class "A" dams** are located in areas where failure will damage nothing more than isolated buildings, undeveloped lands, or town or country roads and/or will cause no significant economic loss or serious environmental damage.

- **Class "B" dams** are located in areas where failure may damage isolated homes, main highways, minor railroads, interrupt the use of relatively important public utilities, and/or will cause significant economic loss or serious environmental damage.

- **Class "C" dams** are located in areas where failure may cause loss of human life, serious damage to homes, industrial or commercial buildings, important public utilities, main highways or railroads, and/or will cause extensive economic loss.

C.R.R. 673 requires dams investigated by the department to be assigned one of the following “condition ratings”: Unsafe, Unsound, Deficiently Maintained, or No Deficiencies Noted.

- **a. Abandonment:** Not defined.
- **b. Engineer:** Not defined.
- **c. Hazard Potential:** Not defined.
- **d. Operator:** Not defined.
- **e. Owner:** Any person (including any individual, firm, co-partnership, association or corporation other than the state and a “public corporation”) or local public corporation (including municipal corporations, district corporations, public benefit corporations and all public authorities, except the Power Authority of the State of New York), erecting, reconstructing, repairing, maintaining or using a dam.
- **f. Person:** Any individual, firm, co-partnership, association or corporation, other than the state or public corporation.
- **g. Repairs:** Not defined.
- **h. Spillway:** Not defined.

**Program Funding**

Department costs for dam safety administration are assessed to the counties in which such administrative duties were executed. The counties then add such amount to the assessment rolls against properties within that county. The counties are responsible for department costs.

E.C.L. § 15-0507. The department shall certify the amount of costs and expenses incurred with the legislative body of the county or counties in which said dam is located, whereupon it shall be the duty of such county legislative body to add the amount so certified to the assessment rolls of such locality or localities as a charge against the real property upon which the dam is located, and to issue warrants for the collection thereof. Thereupon it shall become the duty of such localities through their proper officers to collect the amount so certified in the same manner as other taxes are collected in such locality and when collected to pay the same to the department, who shall
then pay the same into the State Treasury. Any amounts levied shall then become a lien upon the real property affected to the same extent as any tax levy becomes and is a lien thereon. The department may also assert other rights of recovery as may exist by law for such costs and expenses incurred.

**Fees and Costs**

Fees are not expressly assessed for dam safety program administration.

**Permit/Approval Process**

Permit applications, renewals, and modification forms shall be provided by the department and shall provide details of the project works. E.C.L. § 15-0505.

C.C.R. 608 states that a dam permit application must include application forms, a location map, a site plan, a design report, construction plans, watershed investigations, and other information that the department deems necessary. The design, the preparation of plans and specifications, and the construction supervision must be done by a licensed professional engineer; or in the case of farm pond dams, by an engineer or conservationist employed by a government agency, cooperating with a soil conservation district. Article 70 of the ECL and Part 621 of the NYCCR describe procedures and time frames for department review of permit applications. Provisions for public notification and comment are elements of these procedures. C.C.R. 608 states that the department's review will consider such issues as: (1) the environmental impacts of a proposal, (2) the adequacy of design and construction techniques, (3) operational and maintenance characteristics, (4) the safe use of water resources, (5) the water dependent nature of a use, (6) the safeguarding of life and property, and (7) natural resource management objectives and values. The basis for permit issuance must be a determination that the proposed work (1) is reasonable and necessary and (2) will not endanger health, safety, or welfare and (3) will not cause unreasonable, uncontrolled, or unnecessary damage to natural resources. The Department may (1) grant a permit for the work as proposed or (2) grant a permit with conditions as necessary to protect health, safety, welfare, and national resources or (3) deny a permit. The Department publication *Guidelines for Design of Dams* (1985, last revised 1989) contains more specific guidance for design engineers. The publication describes department policy regarding hazard classification, hydrologic analysis, spillway capacity requirements, stability criteria, geotechnical investigations, construction inspection, outlet works, flashboards, cofferdams, emergency action plans, and other technical issues.

If a project requires more than one permit according the regulations (e.g. permit for impoundment construction, permit for use of navigable waterways, permit to disturb stream), only one application may be submitted. C.R.R. 608.

No permits are required for necessary emergency actions, provided department notification is given within forty-eight hours after such work, or agricultural activities that do not affect the natural watercourse or require alteration of the waterway. E.C.L. § 15-0501.

C.C.R. 608, defines "reconstruction or repair" to include breaching or removal of a dam.

**Inspection Process**

Neither the law nor the regulations mandate a frequency of inspections by Department forces. As a matter of policy, high-hazard (class "C") dams are inspected every two years; major-size (federal-size) intermediate -hazard (class "B") dams are inspected every four years. Other dam inspections are conducted as needed.

C.C.R. 673 authorizes the department to inspect and investigate dams, and to assign one of the following condition ratings: (1) "Unsafe", (2) "Unsound", (3) "Deficiently maintained", (4) "No deficiencies noted." If a dam is classified as unsafe or unsound, the department will notify the owner of the hazard classification and condition rating of the dam and of the results of any investigation, and recommend action as the department deems appropriate to correct the
deficiencies. An owner can request a review of the dam's assigned hazard class; the department can require the owner to provide documentation or any other information (dam-break analysis, inundation mapping) for such a request.

C.C.R. 673 authorizes the department to serve a hearing notice on the owner anytime after an investigation. After hearing, the commissioner can issue an order directing the owner to repair or remove the dam.

Right of Entry
Upon violation of an order, the department may enter onto the lands where such structures are located to take the necessary precautions to safeguard life and property or protect the natural resources of the State, so long as the department does not deviate from its order. E.C.L § 15-0507.

Inspections of any dam under these regulations may be conducted by the department or its agents at all times in or upon any property, private or public. C.R.R. 673.5.

C.C.R. 673 authorizes the department to enter the property upon which the dam is situated for the purpose of executing a violation order; the cost may be charged against the owner in accordance with E.C.L. § 15-0507.

Operation and Maintenance
The dam safety laws and regulations do not specifically address operation and maintenance. Operation and maintenance is discussed throughout the various sections.

Emergencies/Emergency Action Plans
E.C.L. § 70-0116 and C.R.R. 608 provide that the department may issue an emergency authorization for work which otherwise requires a dam permit, when such action is immediately necessary to respond to circumstances which present an immediate threat to life, health, property, or natural resources.

The Department of Environmental Conservation Policies and Procedures Manual, Title 1800 (Emergency Operations), Chapter 1855 (Dam Failure Emergencies) sets forth the emergency operating procedure to be followed in the case of dam failure. This chapter outlines the responsibilities of state and local government authorities and the dam owners, notification procedures and channels, and the forms and logs to be maintained.

Owner Non-Compliance/Violations/Penalties
Enforcement of Article 15 is provided for in E.C.L. § 70-11.

A violation of E.C.L. § 15-0503 (dam permit requirement) is a misdemeanor punishable by fine of up to $10,000 or imprisonment of up to one year, or both, in addition to a civil penalty of up to $5,000. E.C.L. § 71-1107. Additionally, E.C.L. § 15-0511 gives the commissioner the power, after hearing to issue an order directing removal, replacement, or correction of an illegal excavation, fill, or dam in or on the waters of the state. Penalties and other remedies for violation of such an order are analogous to those for violation of an order issued pursuant to E.C.L. § 15-0507, as described immediately below.

Violation of an order issued pursuant to E.C.L. § 15-0507 and C.R.R. 673 (order to repair or remove), is punishable by fine of up to $5,000 for each offense; in case of a continuing violation every day's continuance is a distinct offense. E.C.L. § 71-1109.

The department may require the posting of a bond by permittees conditioned upon compliance with an issued permit. E.C.L. § 15-0509.

E.C.L. § 71-0301 and C.R.R. 673 and 620 authorize the commissioner to order summary abatement, prior to hearing, of a condition or activity which presents an imminent danger to the health or welfare of the people of the State, or is causing or will cause irreversible or irreparable
damage to natural resources. Failure to comply with such an order is punishable by civil penalty of up to $500 per violation plus up to $500 per day for continuing violations.

**Recordkeeping**

E.C.L. § 15-0516 states that the department shall provide, within thirty-days of any intermediate or high hazard dam inspection, a report to the mayor, supervisor, or board chairperson of the municipality or county in which the dam is located, or to any county that requests such a report.

**Oversight**

E.C.L. § 15-0515 provides that the issuance, modification or denial of a permit, pursuant to E.C.L. § 15-0503 (dam permit), shall be subject to review pursuant to Article 78 of the New York Civil Practice Law and Rules (CPLR).

E.C.L. § 15-0905 provides for review of a department decision (e.g. Commissioner's order to repair or remove) under the provisions of Article 78 of the CPLR.

Article 78 of the CPLR provides for judicial review, of Department final action, on questions such as performance of duty, jurisdiction, violation of lawful procedure, error of law, abuse of discretion, or evidentiary support.

Hearing procedures are contained in C.R.R. 622.

**Miscellaneous**

a. **Complaints to Unsafe Conditions**
   - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

b. **Environmental Impact**
   - The dam safety laws and regulations do not specifically address environmental impact.

c. **Severability**
   - The dam safety laws and regulations do not specifically address severability.

d. **Supplemental Reference Materials**
   - The dam safety laws and regulations do not specifically address supplemental reference materials.
NORTH CAROLINA

Summary
[Pros] The statute is clearly focused on ‘dam safety law.’ One purpose of the statute is to provide for the certification and inspection of dams in the interest of public health. The “Exempt dams” provision, G.S. § 143-215.25A, is reasonable, yet lists numerous exempt structures. Every applicant for dam approval must also file with the department the certificate of an engineer legally qualified in this State; this certificate states that the engineer is responsible for the safe and adequate design of the dam. The department must send a copy of each completed application to the State Health Director, the Wildlife Resources Commission, the Department of Transportation, and other state and local agencies it considers appropriate for review and comment. The director may waive any permit application requirements, and may also require supplemental details. A certificate of approval must be issued, ensuring that all construction was performed in accordance with approved plans and regulations. There are fees for permit application processing, and for submittal of ‘as-built’ plans for final department approval. Applications and plans will not be accepted without the requisite fees. The payment process is outlined in the administrative code. The department may employ or make such arrangements with geologists, engineers, or other expert consultants and such assistants, as it deems necessary to carry out the provisions of the dam safety program. The factors to consider when determining the violation amount are numerous. The application process and requirements are extensive and technical, covering conduits, spillway requirements, seepage control, structural stability and slope protection, design life of a dam and reservoir, sediment control, safety, and monitoring. Monitoring or inspection devices may be required by the director for use by inspectors or owners in the inspection of dams during and after construction. Monitoring devices may also be required to be installed, read, and documented at specified intervals, with copies forwarded to the director. All Class A and B dams shall be inspected by the department at least once every five years, and Class C dams are inspected once every 2 years. The Dam Safety Account is established as a non-reverting account within the department; fees collected for permit processing shall be credited to the account and applied to the costs of permit processing.
[Cons] Permit approval fees are based on department costs for personnel and administrative activities for processing the application, yet the total fees cannot exceed 1/3 of the total costs in the previous fiscal year. Fees will be reduced upon finding that the revenue generated by fee collection exceeds the statutory limit of 1/3 of department costs. Inspections are primarily the responsibility of the department.

Citation and Title
[Administrative Agency] NC Department of Environment and Natural Resources, Environmental Management Commission

Jurisdiction/Powers of Department
The North Carolina Department of Environment and Natural Resources (“department”) is responsible for the safety of dams and for the adoption of all rules and regulations designed to protect life and property. (Rule .0103) The department has the power to inspect, and approve
permits for construction, alteration, repair, and removal of dams, and to call for remedial work as necessary (Rule .0200). The department is authorized to collect fees for dam construction or removal plans. Any authorized personnel of the department may make an inspection as deemed necessary to ensure compliance. (Rule .0217) The department has the power to cite non-compliance and assess civil penalties. (Rule .0221) The director may in the event of an emergency take any measures deemed necessary to protect life and property. (Rule .0302). Minimum release requirements from dams may be required under Dam Safety Law. The department may employ or make such arrangements with geologists, engineers, or other expert consultants and such assistants, as it deems necessary to carry out the provisions of the dam safety program. G.S. § 143-215.34.

Liability and Immunity
Dam owners are in no way relieved of any liabilities, duties, or legal obligations arising from such ownership or operation (Rules .0302; GS 143-215.35). G.S. § 143-215.35 of the statutes absolves the state or any agent or employee of the department or commission from liability from damages caused by a dam failure or maintenance. Department inspections do not relieve the engineer in charge from the responsibility of providing adequate inspection of the work (Rule .0217).

Definitions/Dam Classifications
*Dam* means any structure which is 15 feet or higher and capable of impounding 10 acre-feet or more of water, and appurtenant works for the impoundment or diversion of water or other fluids. *Dam height* is measured from the lowest existing elevation of the crest to the lowest point of natural ground, including any stream channel along the downstream toe of the dam. (Rule .0104, .0223) Dam height is measured from the highest point on the crest of the dam to the lowest point on the downstream toe. (Rule .0223). High hazard dams smaller than this are subject to state jurisdiction. (Rule .0105)

**Class Classification** – Classifications shall be proposed by the design engineer and are subject to approval by the director. Probable future development of the area downstream from the dam that would be affected by its failure shall be considered in determining the classification. Impact upon downstream dams, and their subsequent failure, shall be factored into dam classification. Classifications can change upon determination by the director that the hazard potential has also changed. Classifications are as follows. Failure results in:

*Low Hazard* damage to uninhabited non-residential areas and low volume roads;
*Intermediate Hazard* damage to highways, public utilities, and minor damage to isolated homes
*High Hazard* damage causing loss of life or serious damage to homes, primary highways and public utilities.

a. **Abandonment**: Not defined.
b. **Engineer**: Legally qualified engineer in the state. “Qualified engineer” means a professional legally qualified to practice in the state, and having appropriate specialty expertise for the particular dam engineering problem with which he is involved.
c. **Hazard Potential**: The probable damage that would occur if the structure failed, in terms of loss of human life and economic loss or environmental damage.
d. **Operator**: Not defined.
e. **Owner**: The individual or association of individuals owning the property on which the dam exists or is to be constructed, and the persons financially responsible for the construction.
f. **Person**: Not defined.
g. **Repairs**: Not defined.
h. Spillway: Not defined.

Program Funding
The Dam Safety Account is established as a non-reverting account within the department; fees collected for permit processing shall be credited to the account and applied to the costs of permit processing. G.S. § 143-215.28A.

Fees and Costs
(Rule .0220) The 1990 state general assembly authorized the use of fees for permitting of dam construction and removal. There is a $200 non-refundable application processing fee with filing of application for construction or removal of a dam. In establishing the fee schedule the commission shall consider the administrative and personnel costs incurred by the department; the total amount of fees collected may not exceed 1/3 of the total personnel and administrative costs incurred by the department for processing applications and for related compliance activities in the prior fiscal year. An approval fee may not exceed the larger of $200 or 2% of the actual cost of construction (GS 143-215.28A).
(Rules .0222) The following additional processing fees are due when as-built plans are submitted and are based upon a percentage of the cost of construction, materials, machinery, land acquisition, labor, and removal of the dam.

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<tr>
<th>Costs of Construction</th>
<th>Fee</th>
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<tbody>
<tr>
<td>Between $10,001 and $100,000</td>
<td>2%</td>
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<tr>
<td>Between $100,001 and $500,000</td>
<td>1.5%</td>
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<tr>
<td>Between $500,001 and $1,000,000</td>
<td>1.0%</td>
</tr>
<tr>
<td>Over $1,000,000</td>
<td>0.5%</td>
</tr>
</tbody>
</table>

The total fee cannot exceed $50,000.
To remain within the statutory limitation imposed upon the fee schedule, the department shall project revenues for the first half of the fiscal year, and order a pro rata fee reduction if necessary to avoid revenue collection in excess of the statutory limits (Rules .0222).

Permit/Approval Process
No one shall construct, repair, alter, or remove a dam without obtaining a permit from the department 10 days before start of construction. Every applicant for dam approval must also file with the Department the certificate of an engineer legally qualified in this State; this certificate states that the engineer is responsible for the safe and adequate design of the dam (GS 143-215.26).
The application must contain location of the dam, purpose, proposed construction, maps, specifications, and descriptions of surrounding properties, geologic investigations and technical provisions. The director may waive any such requirements, and may also require supplemental details (GS 143-215.27). The director shall within 60 days of receipt, notify applicant of approval or denial. Construction of works approved by the director must commence within 1 year from approval date (GS 143-215.28).
No construction shall begin until Certificate of Approval is obtained, which will only be issued after department receipt and approval of the final design report (Rules .0201). This certificate is revocable upon department determination that works were not performed in accordance with the laws or permit conditions. A notice of completion (as-built plans) must be given to the commission immediately upon completion of approved works (30 days); as soon as possible thereafter descriptions showing the dam as actually constructed must be submitted to the department (GS 143-215.30).
(Rule .0201 and .0202) All plans and specs shall be prepared by a professional engineer. Five sets of plans and specifications must be submitted, and shall include identification of the project and
appropriate parties/contacts, geologic investigation, technical provisions, special provisions, and
general provisions specifying the applicant’s rights, duties, and responsibilities.
The applicant is required to complete all investigations prior to submission of the final plans and
application. The scope and degree of which depends upon the conditions of the project site and
hazards created by the proposed structure. These investigations shall encompass foundations and
abutments, construction materials, surveys, and hydrologic investigation (Rules .0204).
(Rule .0203) Financial liability for remedial work lies with the owner.
(Rule .0302) Minimum design spillway criteria are required and are found in Rule .0205.
Final approval must be granted by the department before a dam may be impounded.
The commission may require progress reports during construction, and shall notify the
appropriate persons upon finding that construction is not performed in compliance with approved
plans (GS 143-215.29).
A construction schedule must be submitted to the department, including estimated time of project
completion (Rules .0213).

Inspection Process
All Class A and B dams shall be inspected by the department at least once every five years, and
Class C dams are inspected once every 2 years (Rules .0301).
Inspection during construction shall occur as deemed necessary by the department. (Rule .0217)
The engineer in charge must provide adequate inspection during construction in accordance with
Rules .0216-.0217. No inspection fees are required for inspections made by the department.
Inspections made by the department during construction are dependent in part upon the limits of
available funds.

Right of Entry
The commission has the right to enter at reasonable times on any property, public or private, for
the purpose of investigating the condition, construction, or operation of any dam or associated
equipment or facility, and to require written statements under oath. No person shall refuse entry
or access to any authorized representative of the commission who requests entry for purposes of
conducting an inspection, and who presents credentials, nor shall any person obstruct with any
such representative’s ability to perform their duties (GS 143-215.37).

Operation and Maintenance
The commission shall have jurisdiction and supervision over the operation and maintenance of
dams to safeguard life and property, and to maintain minimum streamflow requirements. The
commission may vary the adopted standards applicable to various dams.
Monitoring or inspection devices may be required by the director for use by inspectors or owners
in the inspection of dams during and after construction. Monitoring devices may also be required
to be installed, read, and documented at specified intervals, with copies forwarded to the director
(Rules .0212).

Emergencies/Emergency Action Plans
Repairs necessary to safeguard life and property may be started immediately by the owner, but
the Department shall be notified of the proposed repairs and works underway, and they shall be
made in conformance with the director’s orders (GS 143-215.27).
The department may issue orders for remedial work, and may take any necessary actions in an
emergency to protect life and property, including lowering the reservoir level or destroying the
dam completely. The commission may recover any costs for remedial action for the appropriate
dam owner (Rule .0302; GA 143-215.32).
Emergency Action Plans are required as a condition of impoundment for all new high hazard
dams.
Owner Non-Compliance/Violations/Penalties

The director may issue an order directing the owner of a dam to make, in not less than 90 days from issuance of the order, any maintenance, alteration, or change in construction upon a finding that the dam is not maintained in good repair or operating condition, or if it is determined that the dam is dangerous to life or property. (Rule .0302) Remedial work is to be paid for by the owner. Penalties for violations include criminal penalties of $100 - $1,000, civil penalties of $100 to $500 per day of violation (each constituting a separate offense), and injunctive relief. In determining the penalty amount, the secretary shall consider:

1. The degree and extent of harm to the natural resources of the State, to the public health, or to private property resulting from the violation;
2. The duration and gravity of the violation;
3. The effect on ground or surface water quantity or quality or on air quality;
4. The cost of rectifying the damage;
5. The amount of money saved by noncompliance;
6. Whether the violation was committed willfully or intentionally;
7. The prior record of the violator in complying or failing to comply with programs over which the Environmental Management Commission has regulatory authority; and
8. The cost to the State of the enforcement procedures (GS 143-215.36).

All civil action shall be filed within 3 years of the date of the final agency decision. Civil action in the superior court of the affected county or counties is also available.

Recordkeeping

Addressed in most sections.

Oversight

Administrative hearings are granted under Rule .0402. Any person whose application has been disapproved, been denied final approval or whose dam has been issued an order for remedial work or construction changes is entitled to a hearing before the commission within 10 days of being notified by the department (Rules .0402). Persons may contest a decision or dam safety order of the department upon mailing a contested case petition within 30 days from receipt of order/decision to the appropriate party (GS 143-215.33).

Miscellaneous

Department malaria control requirements must be maintained (GS 143-215.26).

- a. Complaints to Unsafe Conditions
  - The laws and rules do not specifically address complaints to unsafe conditions.

- b. Environmental Impact
  - Part of the requirement to maintain a minimum streamflow is intended to preserve the habitat of affected aquatic species (GS 143-215.31). Rule .0501 rates aquatic habitats into three categories in order to identify habitats in need of special attention. Rule .0502 identifies the minimum streamflow requirements and technical specifications, as well as measures to increase streamflow to required levels. Rule .0504 establishes additional streamflow measurement and release provisions. Environmental damage is a factor in the consideration of 'hazard potential' (Rules .0104).

- c. Severability
  - The laws and rules do not specifically address severability.

- d. Supplemental Reference Materials
  Procedures, manuals, and criteria used by the U.S. Army Corps of Engineers, U.S. Soil Conservation Service, U.S. Department of Interior – Bureau of Reclamation, or
those approved by the director, represent acceptable design procedures and references (Rules .0219)
NORTH DAKOTA

Summary
[Pros] The State Engineer administers the dam safety program. The State Engineer may require dam or reservoir operators to maintain adequate structures and operate them in a manner that will prevent waste, promote the beneficial use of water, and not endanger the general health and welfare of persons affected thereby. Applicants for a construction permit must demonstrate clear rights to the properties affected by dam construction. The State Engineer has 45 days to approve or deny permit applications, except in unique or complex situations. Temporary permits are available from the State Engineer in case of emergency, having a duration of not more than six months unless extended by the State Engineer. An ‘operating plan’ must be submitted annually to the State Engineer for approval, and shall include emergency procedures and warning plans. Inspections shall be performed by dam owners, at the frequency stated in the permit conditions or as determined by the State Engineer. Inspection frequencies will vary depending on the structure. The State Engineer may inspect works during construction at cost to the owner. The State Engineer is authorized to remove unsafe works at cost to the owner. Violators who continue unsafe or delinquent actions after notice from the State Engineer are guilty of a class A misdemeanor; upgraded from class B for violators without notice. The State Engineer may require persons holding a water appropriation permit to install measuring devices, which must conform to the State Engineer’s specifications, at all points specified by the State Engineer. [Cons] The inspection and permit approval process are very brief. Except in emergencies, the State Engineer must request written permission to enter private property. The laws and regulations do not explicitly state that the Commission may take over the facility in the event of an emergency. The statute focuses on appropriation of water, and the impact of any projects affecting water appropriation. Dam safety program funding is not explicitly addressed. There are no fees for application review, water impoundment, permit issuance, or department inspections in the codes. There is no requirement for state inspections.

Citation and Title

Jurisdiction/Powers of Department
The North Dakota State Engineer, pursuant to Chapter 61-04 and Sections 61-16.1-38 and 61-16.1-53 of the NDCC and North Dakota State Water Commission, pursuant to Section 61-02-14 of the NDCC, have the power and general jurisdiction to regulate, control and supervise the construction and operation of all dams within the State of North Dakota, both public and private, which they deem necessary. The State Engineer may call for remedial work if deemed necessary (NDCC 61-16.1-38 1981). Section 61-02-11 (1943) empowers the Commission to adopt rules and regulations. The State Water Resources Board may seek legal remedies to enforce the provisions contained in these laws and regulations (61-16.1-58 1981). Section 61-04-11 gives the State Engineer the authority to
conduct inspections. The laws and regulations do not explicitly state that the Commission may take over the facility in the event of an emergency. The State Engineer is authorized to issue administrative orders requiring the immediate cessation of water use when the State Engineer has reasonable belief that such use is unauthorized or that continued use will damage the rights of prior appropriators (NDCC 61-04-29).

**Liability and Immunity**

Receipt of a permit from the State Engineer does not relieve an applicant from liability for damages resulting from liability for damages resulting from any activity conducted pursuant to the permit (NDAC 89-08-02).

A design professional who plans and supervises a construction project will be liable to all persons who may be injured if he does not fulfill his duty of properly exercising the skill he is assumed to possess.

Owners of dams have a continuing duty to maintain their dams in a safe and hazard-free condition. Their duty also applies to the area adjacent to the dam. Liability may result if it is determined that injury or damages occurred as a result of an owner's negligence in maintaining a dam (Handbook--Chapter II).

There is no statement in the laws about liability of the state.

**Definitions/Dam Classifications**

A dam is defined as an artificial barrier, together with any associated spillways and appurtenant works, across a watercourse or natural drainage area, which does or may impound or divert water (Handbook p. 37). All dams constructed within a district automatically fall under the jurisdiction of the water resources board (NDCC 61-16.1-39 1981).

Dam height is the distance between the stream channel bottom at the centerline of the dam to the top of the settled embankment (Handbook p. 37).

Dams are categorized according to the potential hazard to property or loss of life if the dam should suddenly fall.

- **Low** - Dams located in rural or agricultural areas where there is little possibility of future development. Failure of low hazard dams may result in damage to agricultural land, township and county roads, and farm buildings other than residences. No loss of life is expected if the dam fails;
- **Medium** - Dams located in predominantly rural or agricultural areas where failure may damage isolated homes, main highways, railroads or cause interruption of minor public utilities. The potential for the loss of a few lives may be expected if the dam fails;
- **High** - Dams located upstream of developed and urban areas where failure may cause serious damage to homes, industrial and commercial buildings and major public utilities. There is a potential for the loss of more than a few lives if the dam fails.

[Dam Height Hazard Categories (ft.) - Low Medium High]

Less than 10 I II IV 10 to 24 II III IV 25 to 39 III III IV 40 to 55 III IV V over 55 III IV V

(Dam classifications are found in the Handbook Chapter IV p. 3).

a. **Abandonment**: Not defined.
b. **Engineer**: A person who has been duly registered and licensed as an engineer by the North Dakota state board of registration for professional engineers and land surveyors.
c. **Hazard Potential**: Not defined.
d. **Operator**: Not defined.
e. **Owner**: Any person who owns, controls, operates, maintains, manages, or proposes to construct a dam, dike, or other device, except that for the purpose of signing the application for construction permit, “owner” means the person who owns the
property or interest in property upon which the dam, dike, or other device will be
built.

f. **Person:** Includes political subdivisions, corporations, limited liability companies,
   partnerships, associations, the United States and its departments or agencies, the state
   and its departments or agencies, and any other legal entity.

g. **Repairs:** Not defined.

h. **Spillway:** Not defined.

**Program Funding**

(NDCC 61-02.1-02.1) [Though not explicitly designated for dam safety] The State Water
Commission may appropriate funds for the construction of statewide water development projects
from the resources trust fund, water development trust fund, or via bond issuance.

**Fees and Costs**

Inspections and any remedial work are to be paid for by the owner. Inspections conducted by the
State Engineer during construction shall be paid by the owner; such fees constituting a lien on the
property (NDCC 61-04-11).

The laws and regulations do not contain information regarding filing fees or bond requirements.

**Permit/Approval Process**

Dams diverting more than 12 ac-ft of water require a construction permit. Applications are made
to the State Engineer and must include complete plans and specifications for the dam and
evidence recognized in a court of law sufficient to establish a prima facie case of property right in
the property that will be affected by the construction of the dam (NDAC 89-08-02).

The State Engineer completes the initial review in 45 days. The application and any modifications
are then sent to the appropriate district's water resource board, which reviews and makes its own
recommendations. After 45 days, the board returns the application to the State Engineer, who
makes the final decision to approve or disapprove the application (NDCC 61-16.1-38 1981).

The State Engineer will make frequent inspections to determine progress and conformance to
construction drawings and specifications.

Suggested spillway design specifications are outlined in the Handbook--Chapter V.

Section 43-19.1-28 of the NDCC requires the state or any political subdivision (including water
resource boards, commissions, etc.) to hire a professional engineer to make all engineering
drawings, specifications, estimates, and to supervise construction if the cost of the project exceeds
$50,000.

Section 61-03-21 (1963) of the NDCC requires operators of dams with storage capacity of more
than 1000 ac-ft to file an annual operating plan with the State Engineer.

Temporary permits may be issued in case of emergency, with a duration of six months unless
extended by the State Engineer (NDAC 89-08-02).

“As built” plans must be provided to the State Engineer after construction (NDAC 89-08-03).
Part of the permit process requires notification to all record title holders of real estate within a
radius of one mile from the location of the proposed water appropriation site, general notice to all
municipal or public use water facilities within a 12 mile radius of the proposed water
appropriation site. Such notice shall include essential facts of the proposed appropriation (NDCC
61-04-05). Public hearings shall be held upon written request by anyone aggrieved by water
appropriation projects.

Permits for water appropriations may be transferred or assigned only upon approval from the
State Engineer (NDCC 61-04-15).

All persons holding a water permit must annually submit to the State Engineer topographic,
mapping, foundation test borings, design, water use, and such other information as the State
Engineer shall require (NDCC 61-04-27).
Inspection Process
All inspections are the responsibility of the owners and must be made by "properly trained people".
During construction, inspections must be performed by an engineer at intervals necessary to ensure conformity with the construction permit, plans, and specifications. Reports must be submitted to the State Engineer within seven days of inspection. Periodic inspections shall be performed after construction as necessary, at the request of the State Engineer, to protect property and assure safety (NDAC 89-08-03).
In general, it is recommended that a design class III dam is inspected every two years, and class IV and V dams once a year. Also, all dams should be inspected if the emergency spillway is used, or if possible deficiencies are noted (Handbook--Chapter IX). There is no requirement for State inspections.
The State Engineer will make frequent inspections to determine progress and conformance to construction drawings and specifications.

Right of Entry
Whenever authorized or mandated by law to investigate or inspect a structure, the State Engineer has the authority to enter upon said land for such purposes. Except in emergencies, the State Engineer must request written permission to enter private property (NDCC 61-03-21).

Operation and Maintenance
Every year, operators of reservoirs with impoundment capacities over 1,000 acre-feet shall submit an ‘operating plan’ to the State Engineer for approval. If deficiencies exist, the operator must address them. The operating plan must include: a reservoir operation procedure; maintenance procedure for the dam and appurtenant works; and emergency procedures and warning plans (NDAC 89-08-04). A supplemental operating plan shall be submitted to the State Engineer in event of emergency, and shall be implemented with the existing, annual, plan.
The State Engineer may require dam or reservoir operators to maintain adequate structures and operate them in a manner that will prevent waste, promote the beneficial use of water, and not endanger the general health and welfare of persons affected thereby (NDCC 61-03-21).
The State Engineer may require persons holding a water appropriation permit to install measuring devices, which must conform to the State Engineer’s specifications, at all points specified by the State Engineer (NDCC 61-04-27).

Emergencies/Emergency Action Plans
Emergency procedures and warning plans must be included in the ‘operating plan’ (NDAC 89-08-04).
Section 61-16.1-53 (1981) of the NDCC states that in the event of an emergency, the board may immediately apply to the appropriate district court for an injunction prohibiting the construction or operation of a dam.
It is strongly recommended that an Emergency Action Plan be developed for all dams. The level of detail should be commensurate with the hazard category of the dam.
Categories of Action are recommended. Category I would be a plan of action in the event of extremely severe occurrences. Category II would pertain to intermediate dangers that could develop into a more serious problem (Handbook--Chapter X).

Owner Non-Compliance/Violations/Penalties
Violators of permit regulations are guilty of a class B misdemeanor, and are liable for damages proximately caused by the dam or reservoir (NDCC 61-16.1). Violators with notice from the State Engineer that their works are unsafe for the purpose in which they are used shall be guilty of a class A misdemeanor (NDCC 61-04-12).
Upon receipt of a complaint of unauthorized construction of a dam, the water resource board will investigate and make a determination thereon. If the board finds that a dam diverting more than 12.5 ac-ft is in violation of any law or regulation, the board will cause removal of the dam at the owner's expense (NDCC 61-16.1-53 1981).

In the event an operator fails to maintain or operate a dam or reservoir in compliance with these rules and the conditions of their permit, the State Engineer shall schedule a hearing and notify the suspect owner of possible permit revocation (NDCC 61-03-21).

The State Engineer is authorized to remove unsafe works after notification to the owner and allowance for owner to make required repairs or maintenance. In the event of emergency, the State Engineer may immediately apply to the appropriate court for an injunction prohibiting the owner from constructing or maintaining works. Any assessments levied under this chapter shall be paid by the owner, or owners if multiple parties are involved (NDCC 61-03-21).

Recordkeeping
Addressed through other sections.

Oversight
Any person aggrieved by action of the board under the provisions of the rules and regulations may appeal the decision of the board to the district court of the county in which the land is located in accordance with the procedures provided under sections 61-16.1-54 through 61-16.1-57 of the NDCC. A public hearing is not a prerequisite for such an appeal.

Miscellaneous
   a. Complaints to Unsafe Conditions
      - The State Engineer shall examine the available information upon receipt of an affidavit complaining a dam is unsafe. If complainant insists despite a initial finding by the State Engineer that the dam is not unsafe, a deposit in the amount sufficient to cover the total cost of inspection shall be made by complainant; returnable upon finding that the dam is unsafe; kept by the State Engineer upon finding that the complaint is unfounded (NDAC 89-08-03).
   b. Environmental Impact
      - The dam safety laws and rules do not specifically address environmental impact.
   c. Severability
      - The dam safety laws and rules do not specifically address severability.
   d. Supplemental Reference Materials
      - North Dakota Design Handbook 1985
OHIO

Summary
[Pros] The Ohio Revised Code regulates dams under the framework of natural resource development. With approval from the Director of Natural Resources, the Chief of the Water Division is authorized to transfer appropriated or other funds – authorized for the inventory of water and related natural resources in each drainage basin of the State, and for the implementation of the State water management plan – to any division of the Department for the purpose of developing pertinent data relating to the plan of water management. The Chief is also authorized to accept and expend moneys contributed by any person for implementing the development of this plan. The Chief is also authorized to hold public meetings or hearings to assist in the resolution of conflicts between groundwater users. Permit filing fees are based on estimated costs of the proposed project, and must not be less than $1,000 or more than $100,000. Annual fees based on dam height must be submitted to the Chief. Persons who do not pay the fees are assessed a penalty of 10% of the annual fee plus interest at the rate of ½% per month from the due date to the date of payment. The procedure for applying for a construction permit and submitting supporting engineering documents consists of two parts: (1) the preliminary design report; and (2) the final design submittal. The construction permit is valid for two years, but may be extended if the project warrants extension or if the Chief is satisfied that substantial effort has been made to complete the construction as approved. During construction, the owner is required to have a registered engineer conduct inspections in accordance with the terms of the permit, plans, and specifications. The Chief is primarily responsible for periodic dam inspections, however, dam owners are required to maintain their dams in safe condition and to establish an inspection schedule in their ‘operation, maintenance, and inspection manual’, whereby inspections performed by owner/operator’s employed engineer must submit copies of their inspection reports to the Chief within 10 days of inspection. Owners shall retain the services of a registered professional engineer who has been approved by the Chief to conduct the periodic inspections of the dams pursuant to the rules and directive from the Chief. If such inspections are not conducted accordingly, the Chief shall conduct them at owner’s expense. Inspection devices, including permanent benchmarks, may be required by the Chief for inspections conducted by either the department or owner. A surety bond, cash, federal government securities, or certified negotiable certificates in the amount equal to 50% of the estimated project costs shall be provided to the Chief (who shall deliver them to the Treasurer to hold in trust for the purposes for which they have been deposited) along with permit applications. Such bond shall be returned within one year after completion of satisfactory work performed in compliance with the approved permit, and that the structure does not endanger life, health, or property (ORC § 1521.06, 061). This surety bond, based on the detailed cost estimate for the proposed construction, is provided to ensure that all proposed works are completed as approved or are rendered non-hazardous if left incomplete. Dams are classified into 4 classes, as established by the Chief, however in no way shall these classifications preclude the Chief’s requirement of greater safety in the interest of life, health, or property. A ‘dam safety fund’ is created by the ORC, in which to deposit all fees and fines collected pursuant to these rules. All state expenditures made for the purpose of administering the dam safety program shall be made from this fund. Dam or reservoir owners not within the corporate limits of any municipal corporation of the State who collect and store water for the State, or who allow the State to erect and maintain a reservoir on their property, are given a reduction of the assessed valuation of their lands.
The structures exempt from permitting, though not uncommon, are numerous and may possibly warrant more stringent regulation. At a minimum, dams must be inspection at least once every 5 years.

Citation and Title
[Rules/Regulations] Administrative rules enacted by the Division of Water of the Department of Natural Resources supplement the permit and inspection statute and reflect Division of Water policy and procedures in carrying out the intent of the law (enacted April 15, 1972, revised Oct. 15, 1981, and December 9, 1999).
[Administrative Agency] Department of Natural Resources, Division of Water, Chief

Jurisdiction/Powers of Department
Sections 1521.02-064 of the ORC place the authority for implementation of the dam safety laws within the Division of Water of the Department of Natural Resources. § 1521.03 grants the Chief the authority to assist recognized municipalities, district, or other government agencies in an advisory capacity regarding water conservation practices.
Section 1521.06 requires that persons or governmental agencies desiring to construct certain dams must obtain a construction permit from the Chief of the Division of Water. The Chief has the power to approve or disapprove an application.
Sections 119.01 to 119.13 of the ORC give the Chief of the Division of Water the power to prescribe rules and regulations.
Section 1521.062 of the ORC gives the Chief the power to call for remedial measures, as he deems necessary to safeguard life, health, or property.
If the owner fails to perform such repairs, maintenance, remedial measures, or other measures within the required time period as may have been ordered by the Chief, the Chief has the right to cite noncompliance and seek judicial measures to have the structure removed (Administrative Rules 1501:21-21-05).

Liability and Immunity
Pursuant to the provisions of section 1521.062 of the ORC, the owner of a dam shall be responsible for the continued safe operation and use of the structure so that it does not constitute a hazard to life, health, or property.
In the interest of safeguarding life, health, or property, the Chief may require the owner to prepare a written manual detailing the operation, maintenance, and inspection procedures necessary for the continued safe operation of the dam (Administrative Rules 1501:21-21-04).

Definitions/Dam Classifications
*Dams* are defined as any artificial barrier together with appurtenant works which either does or may impound water or liquefied material. Upright reservoirs and lagoons are considered to be dams. A fill or structure intended solely for highway or railroad use that does not permanently impound water or other liquefied material as determined by the Chief is not considered a dam (Administrative Rules Chapter 3-1501:21-3-01[E]).

*Dam height* means the vertical dimension as measured from the natural stream bed or watercourse at the downstream or outside toe of a dam to the top of the dam (Administrative Rules Chapter 3-1501:21-3-01[I]).
Dams are classified into 4 classes, as established by the Chief, however in no way shall these classifications preclude the Chief’s requirement of greater safety in the interest of life, health, or property (OAR § 1501:21-13-01). Classification criteria for dams are found in the Administrative Rules Chapter 13-1501:21-13-01:
(1) A dam shall be placed in class I when failure of the dam would result in probable loss of human life. Dams having a total storage volume greater than five thousand acre-feet or a height of greater than sixty feet shall be placed in class I.

(2) Dams having a total storage volume greater than five hundred acre-feet or a height of greater than forty feet shall be placed in class II. A dam shall be placed in class II when failure of the dam would result in at least one of the following conditions, but loss of human life is not envisioned.

   (a) A possible health hazard, including but not limited to loss of a public water supply or wastewater treatment facility.
   (b) Probable loss of high-value property, including but not limited to flooding of residential, commercial, industrial, publicly owned, and/or valuable agricultural structures, structural damage to downstream class I, II or III dams, dikes or levees, or other dams, dikes or levees of high value.
   (c) Damage to major roads including but not limited to interstate and state highways, and roads which provide the only access to residential or other critical areas such as hospitals, nursing homes, or correctional facilities as determined by the Chief.
   (d) Damage to railroads, or public utilities.

(3) Dams having a height of greater than twenty-five feet, or a total storage volume of greater than fifty acre-feet, shall be placed in class III. A dam shall be placed in class III when failure of the dam would result in at least one of the following conditions, but loss of human life or hazard to health is not envisioned.

   (a) Property losses including but not limited to rural buildings not otherwise listed as high-value property in paragraph (A) of this rule, and class IV dams, dikes and levees not otherwise listed as high-value property in paragraph (A) of this rule. At the request of the dam owner, the Chief may exempt dams from the criterion of this paragraph if the dam owner owns the potentially affected property.
   (b) Local roads including but not limited to roads not otherwise listed as major roads in paragraph (A) of this rule.

(4) When failure of the dam would result in property losses restricted mainly to the dam and rural lands, and no loss of human life or hazard to health is envisioned, the dam may be placed in class IV. Dams which are twenty-five feet or less in height and have a total storage volume of fifty acre-feet or less may be placed in class IV. No proposed dam shall be placed in class IV unless the applicant has submitted the preliminary design report required by rule 1501:21-5-02 of the Administrative Rules.

The following dams are exempt from the construction permit requirement:

- Dams constructed under Chapter 1513 ORC (coal mine impoundments).
- Dams, regardless of height, which have a storage capacity of not more than 15 acre-feet.
- Dams less than 10 feet in height, with a storage capacity of not more than 50 acre-feet.
- Dams designed and constructed by the United States Army Corps of Engineers.
- Dams constructed by the state of Ohio, Department of Natural Resources.
- Dams placed by the Chief in class IV under rules 1501:21-13-01 or 1501:21-13-09 of the Administrative Rules.
- Modifications or repairs to existing dams provided that the modifications or repairs do not constitute an enlargement to the structure as defined under rule 1501:21-3-01 of the Administrative Rules.

Dams shall be able to handle the minimum design flood (i.e. run-off from the design storm) according to their classification. For example, Class I dams must be able to handle the probable maximum flood or the critical flood, whereas Class III dams need only handle 25% of the probable maximum flood or the critical flood (OAR 1501:21-13-02).

a. Abandonment: Not defined.
b. **Engineer:** Registered professional engineers who are qualified in the design, construction, and inspection of dams and levees and who are practicing in accordance with the laws of Ohio.

c. **Hazard Potential:** Not defined.

d. **Operator:** Not defined.

e. **Owner:** Those who own, or propose to construct a dam or levee.

f. **Person:** The United States, the state, any political subdivision of the state, the department, division, board, commission, agency, or instrumentality of the United States, the state, or a political subdivision of the State.

g. **Repairs:** Not defined.

h. **Spillway:** “Spillway” is not defined, however each dam is required to have a spillway system which will safely operate during the design flood without endangering the safety of the dam. Each spillway must include means of dissipating the energy flow without endangering the safety of the dam.

An emergency overflow spillway is required, except when specifically exempted by the Chief. A vegetated or unlined emergency spillway will be approved by the Chief, but only after the applicant has demonstrated that it will pass the design flood without jeopardizing the safety of the structure (OAR § 1501:21-13-04).

**Program Funding**

With approval from the Director of Natural Resources, the Chief of the Water Division is authorized to transfer appropriated or other funds – authorized for the inventory of water and related natural resources in each drainage basin of the State, and for the implementation of the State water management plan – to any division of the Department for the purpose of developing pertinent data relating to the plan of water management. The Chief is also authorized to accept and expend moneys contributed by any person for implementing the development of this plan (ORC § 1521.03 (B)).

The Chief, with approval from the Director of Natural Resources, may use the “water management fund” to acquire, construct, reconstruct, improve, equip, maintain, operate, and dispose of water management improvements. Direct and indirect costs of administration may be paid from this fund (ORC § 1521.04).

All fees and fines collected pursuant to this section shall be deposited in the State Treasury to the credit of the dam safety fund, which is hereby created. Expenditures from the fund shall be made by the Chief for the purpose of administering this section (ORC § 1521.06).

Upon finding that an owner has not performed project construction to, or otherwise failed to meet compliance with, the conditions of their surety bond, the Chief shall determine the amount of deposit forfeited, and notify the attorney general, who shall collect that amount. All moneys collected on account of forfeiture of financial sureties shall be credited to the dam safety fund to expend the completion of such dams for which the bonds have been forfeited or to otherwise render them non-hazardous (ORC § 1521.061).

A surety bond, based on the detailed cost estimate for the proposed construction, must be provided to ensure that all proposed works are completed as approved or are rendered non-hazardous if left incomplete. Upon dissatisfaction with the bond terms, the Chief may require the affected owner to complete the construction needed, or forfeit the bond in an amount sufficient to correct the construction or render the dam non-hazardous (OAC 1501:21-7-03).

**Fees and Costs**

The Chief is granted authority to fix, alter, charge, and collect fees, rentals, and other charges, to be paid into the water management fund by government agencies and persons who are supplied with water by facilities constructed and operated by the Department (ORC § 1521.04).
The Rules do not specify any inspection fees to be paid by the owner, however annual fees and filing fees are assessed.

As required by Section 1521.063 of the ORC, the owner is required to pay an annual fee to the Division based on the classification and size of the dam. Owners of pre-permit, Class I, II, and III dams must also pay an annual fee. Political subdivisions are exempt from paying this fee.

- Class I dams: $30 plus $10/foot of height of dam.
- Class II dams: $30 plus $6/foot of height of dam.
- Class III dams: $30 plus $4/foot of height of dam.

Filing fees are based on detailed cost estimates for the proposed construction as filed with and approved by the Chief, and are as follows:

- For the first $100,000 of estimated cost: a fee of 4%.
- For the next $400,000 of estimated cost: a fee of 3%.
- For the next $500,000 of estimated cost: a fee of 2%.
- For all costs in excess of $1,000,000: a fee of ½%.

In no case shall the filing fee be less than $1,000 or more than $100,000. If the actual costs exceed the estimated costs by more than 15%, an additional filing fee shall be required equal to the fee determined by the original schedule (above) less the original filing fee (ORC § 1521.06).

Persons who do not pay the fees are assessed a penalty of 10% of the annual fee plus interest at the rate of ½ % per month from the due date to the date of payment (ORC 1521.063).

A construction permit shall not be issued until a surety bond, or equivalent financial security approved by the Department, in the amount equal to 50% of the proposed project costs is executed and filed according to the terms of the permit, plans, and specifications. This bond or other security shall be released after the project is completed to the satisfaction of the Chief and permit, plans, and specifications (ORC § 1521.061). Also see “Permit/Approval Process” for additional surety bond provisions.

**Permit/Approval Process**

The procedure for applying for a construction permit and submitting supporting engineering documents consists of two parts: (1) the preliminary design report; and (2) the final design submittal (OAR § 1501:21-5-01). The preliminary design report consists of a general description of the dam or project, including a statement of purpose, location maps, roads, property ownership, preliminary design assumptions, a written report of surficial conditions, streamflow analysis, and a statement setting for the impact of such dam as it relates to endangering human life, health, or property. The final design report consists of more technical information and investigations including stability and settlement analysis, hydrologic, hydraulic, and structural analyses, erosion minimization efforts, detailed costs estimates, an emergency action plan, and other information deemed relevant by the Chief. The plans must be formatted according to department specifications (OAR § 1501:21-5-06). Applicants shall submit in writing a schedule of the proposed construction including the estimated completion time (OAR § 1501:21-15-01).

(ORC § 1521.06) Before a permit may be issued, three copies of the plans and specifications, including a detailed cost estimate, for the proposed construction, prepared by a registered professional engineer, and any other information requested by the Chief, together with a fee (graduated scale – based on the estimated cost of construction) and the bond or other security required by section 1521.061 of the ORC, shall be filed with the Chief. The Chief shall within 45 days from the date of the receipt of the application, fee, and bond or other security, issue or deny a permit for the construction or may issue a permit conditioned upon the making of such changes in the plans and specifications for the construction as he deems advisable if he determines that the construction of the proposed dam would endanger life, health, or property. If the permit is denied, the bond or other security is returned to the applicant.
After the construction is completed in accordance with the terms of the permit and the plans and specifications, the Chief will approve the construction. As-built plans must be submitted. One year later, if no evidence of non-compliance is evident, the bond is released (ORC 1521.06).

Required spillway design standards are found in the Administrative Rules Section 1501:21-13-03 through -05. The construction permit is valid for two years, but may be extended if the project warrants extension or if the Chief is satisfied that substantial effort has been made to complete the construction as approved (OAC 1501:21-9-01).

Dams are required to have spillways, sufficient freeboard (i.e. distance from water surface to dam crest/top), and drains or pipe conduits

Dam construction, including remedial work, is to be paid for by the owner (Administrative Rules 1501:21-21-05).

[Repair, Improvement, Alteration, or Removal]

Before commencing the repair, improvement, alteration, or removal of a dam, dike or levee, the owner shall file an application including plans, specifications, and other required information, and shall secure written approval of the application by the Chief. Emergency actions by the owner required to safeguard life, health, or property are exempt from this requirement (ORC 1521.062).

**Inspection Process**

[State] Section 1521.03 of the ORC gives the Chief the authority to conduct basic inventories and inspections of all water and natural resources in each drainage basin of the State, or to oversee inspections conducted by an engineer employed by the owner. Periodic inspection protocol is outlined in OAC § 1501:21-21-02.

Pursuant to Section 1521.062 of the ORC, periodic inspections will be made by the Chief of all class I, II, and III dams to assure that their continued operation and use does not constitute a hazard to life, health, or property. The Chief may make, as deemed necessary, periodic inspections of Class IV dams (Administrative Rules § 1501:21-21-01).

The Chief may make inspections during construction as deemed necessary to insure that the structure is being built in compliance with the approved plans and specifications (Administrative Rules 1501:21-17-01). Inspection intervals shall be determined by the Chief, but shall not exceed five years (ORC 1521.062).

The Chief is authorized to conduct any monitoring or investigations pertaining to the water resources of the State; such inspection depth and frequency dependent on the scope and degree of precision required for that particular project (ORC § 1521.03; OAR 1501:21-11-01).

Investigations shall take into account: foundation investigations; on-site construction materials; hydrologic and hydraulic investigations.

[Owner] The owner is required to have a registered professional engineer perform all inspections – during and after construction – and submit the required inspection reports to the Chief (Administrative Rules 1501:21-3-02; ORC § 1521.06 (E) & (F)). If such inspections are not conducted, or the required reports are not submitted, the Chief shall inspect the construction and the cost of inspection shall be charged against the owner. Inspection devices such as piezometers, settlement platforms, stand-pipes, tell-tale stakes, monitoring weirs, inclinometers, and permanent bench marks may be required by the Chief for inspections conducted by either the department or owner (OAR § 1501:21-13-08).

Owners shall retain the services of a registered professional engineer who has been approved by the Chief to conduct the periodic inspections of the dams pursuant to the rules, and directives from the Chief (ORC 1521.062).

E).

Structures may be exempt from inspections under these rules if, upon determination by the State Engineer, the continued operation will not constitute a hazard to life, health, or property (ORC 1521.064). Owners of such structures must first apply for an exemption under these rules (OAR 1501:21-19-02).
Right of Entry
The Chief or any employee in the service of the division may enter upon lands to make surveys or conduct inspections (ORC 1521.07).

Operation and Maintenance
An ‘operation, maintenance and inspection manual’ is required for all Class I, II, and III dams. The manual will include a program for regular inspection by the owner or operator, and shall be submitted to the Chief for approval (Administrative Rules 1501:21-15-06).
Dam or reservoir owners must perform all repairs, maintenance, investigations, or other remedial operational measures the Chief considers necessary to safeguard life, health, and property. Owners shall also monitor, operate, and maintain the structure in accordance with the rules and permit conditions (OAC 1521.062).
Owners who donate to the State or any of its agencies a tract of land for which to construct and maintain a reservoir for the storage of water, or owners who authorize the State to utilize collected and stored waters, are entitled to a reduction of the assessed valuation of the tract of land upon which such reservoir is located of $40/acre-foot of storage capacity afforded by such dam. The total amount of such reduction shall not exceed 40% of the assessed valuation of the entire contiguous acreage upon which the said reservoir is located (ORC 1521.09).
Grass vegetation or other vegetation of similar properties are the only acceptable vegetative covers for earthen dam embankment surfaces or vegetated earth spillways. Trees and brush are not acceptable surface covers (OAR § 1501:21-13-08).

Emergencies/Emergency Action Plan
An emergency action plan is required for all class I, II, and III structures. The emergency action plan for all class I structures shall include but not be limited to an inundation map of the critical routing reach. An inundation map may also be required for class II and III dams as designated by the Chief. The required detail of this map depends upon the complexity of the downstream hazard and shall be acceptable to the Chief. (Administrative Rule 1501:21-15-07)
Emergency actions by the owner required to safeguard life, health, or property are exempt from permitting requirements (ORC 1521.062 E).
The Chief of the Division of Water is empowered to take charge of a dam safety emergency to protect life, property, and health. Emergency Action Plans are addressed in the operation, maintenance, and inspection manuals. The manual is prepared by the Division of Water and contains specific recommendations for the formulation of EAPs by the owners.

Owner Non-Compliance/Violations/Penalties
If the owner fails to perform repairs, maintenance, remedial measures, or other measures as mandated by the Chief, the Chief shall so notify the owner of the noncompliance and of the Chief's intention to remove or correct the unsafe structure, at the expense of the owner, pursuant to section 1521.062 of the ORC. Such cost is a lien upon such lands from the date of entry and shall be collected as other taxes and returned to the division (Administrative Rules 1501:21-21-05). Section 1521.99 of the ORC establishes penalties for violations of Section 1521.06 and 1521.062: misdemeanor in the 4th degree; and, fines between $100 and $1,000, each day constituting a separate offense.
The Chief may remove a dam, completely drain the reservoir, or lower the water level if deemed necessary to protect the public safety; the cost for such remedial measures assessed to the appropriate owner (OAC 1521.062).
Recordkeeping
Addressed throughout other provisions.

Oversight
All orders of the Chief are subject to appeal pursuant to sections 1521.06, -062, and 119.01 to 119.13 of the ORC. Filing of an appeal does not automatically stay the effectiveness of the orders of the Chief (Administrative Rules 1501:21-23-01).

Miscellaneous
a. Complaints to Unsafe Conditions
   - Not explicitly addressed in the rules or statue.
b. Environmental Impact
   - Environmental impact is not a focus of Ohio state dam safety laws.
c. Severability
   - The invalidation by a court of a rule adopted or amended pursuant to sections 1521.06 to 1521.064 of this code shall not affect the validity of any other rule or portion thereof adopted or amended thereunder by the Chief (OAC 1501:21-1-04).
d. Supplemental Reference Material
   - An Operation, Maintenance, and Inspection Manual
   - Guidelines for Developing EAPs and Operation and Maintenance Manuals
   - Dam Safety Related Fact Sheets (available on Ohio Web Page): Lake Drains, Rodent Control, Trees and Brush, Classification, Failures, Seepage, Concrete Repair Techniques, Inspection of Concrete Structures, Construction Permits for Dams, Design and Maintenance of Trashracks, Probable Maximum Flood, Annual Fee, Construction Permits for Levees, Open Channel Spillways (Earth and Rock)
   - Dam, Dike and Levee Construction Related Forms:
     Application for a Permit to Construct a Dam, Dike or Levee in the State of Ohio
     Instructions for Application for a Permit to Construct a Dam Dike or Levee in the State of Ohio
   - Preliminary Design Report Requirements 1501:21-05-02
   - Revised Construction Permit Filing Fees
   - Performance Bond
OKLAHOMA

Summary
[Pros] The legislative intent section seems to expand the scope of dam regulation by stating a variety of purposes for maintaining dams, reservoirs, and their subsequent safety regulations; irrigation, industrial uses, agriculture, recreation, fish and wildlife, water quality control, sediment control, and more. The powers granted to the Water Resources Control Board (Board) are in addition to other powers and duties provided by law, but shall not be limited according to the law. The Board’s duties include disseminating information about the dam safety program. The Board engineer must be registered and have practical knowledge and experience on dam analysis, design, and construction. Owners are responsible for dam safety, application for construction or alteration, and maintenance and operation. Registered engineers employed by the owner are responsible for implementation and exercise of Board-approved actions. Owners may apply for a variance or waiver to the rules if cost of compliance without such variance would impose significant expense without providing for additional safety. Owners must keep records pertaining to dam design, construction, operation, and maintenance. During dam construction, modification, and operation, the Board shall inspect the site at owner’s expense unless specified (e.g. non-scheduled inspections or emergency inspections where no violations are found). Dam hazard classifications are adjustable by the Board according to development of affected downstream areas. Dam and spillway design specifications are calculated according to dam hazard, size, possible maximum flood volume, and difference from the crest of the dam to the water level (i.e. “freeboard”). Surrounding vegetation and water rights are addressed in the rules. If required by the Board, the Board shall give public notice of any approved dam applications and opportunity for public comment and protest. The Board is granted broad enforcement power to mitigate the dangers created by owners refusing to comply with these rules.

[Cons] State regulations do not govern dams or barriers that do not fall under the statutory scope, leaving unregulated some water-impounding structures that may pose conceivable risks (high hazard potential dams are regulated, regardless of size or water impoundment volume). No annual fees are assessed. Legal fees to recover any costs incurred by the Board are not addressed.

Citation and Title
[Administrative Agency] Oklahoma Water Resources Board
Jurisdiction/Powers of Department
(OS 110.2) Oklahoma legislative intent states it is the purpose of dam safety legislation to impound water and create reservoirs for irrigation, industrial use, recreation, fish and wildlife, water quality control, flood prevention and control, sediment control, and other beneficial uses. As such, regulation of dam construction, operation, and maintenance is granted to the Oklahoma Water Resources Board (Board) to protect lives and property by promulgating rules, reviewing applications, supervising construction, inspections, requiring maintenance, or repairs, having access, cooperating with other governments and private persons, disseminating information, and exercising all necessary powers. Under no circumstances shall these rules limit the Board of any exercise of powers, duties, and jurisdiction conferred by law (Rules 785:25-1-1). Provisions of these rules shall be supplementary to other provisions of law (OS 110.12).
Title 82 of the Oklahoma Statutes 1981, section 1085.2, as amended, requires the Board to adopt rules and regulations deemed necessary to the exercise of any powers conferred upon it.
(OS 110.7) The dam safety program shall be supervised within the Board by an engineer registered with the State Board of Registration for Professional Engineers and Land Surveyors or successor agency, and who shall have practical training or experience concerning the analysis, design, and construction of dams and reservoirs.
The Board is empowered to issue permits and review and approve applications for the construction, enlargement, alteration, or repair of any dam (Rules 785:25-5-1). The Board's responsibility over dams shall be limited to dams with a height of twenty-five feet or more, or those with an impounding capacity of fifty acre-feet or more (Rules 785:25-3-1). The Board is empowered to inspect dams during construction (Rules 785:25-7-1) and after construction is completed (Rules 785:25-7-3). The Board has the power to cite noncompliance and call for remedial work (Rules Chapter VII730.4) and may invoke judicial actions if necessary (Rules 785:25-11-1).
Dams constructed by the United States or its duly authorized agencies shall not be subject to inspection while under the supervision of the officers of the United States (Rules 785:25-9-1). Board decisions are binding upon all State agencies as to the safety of the dam (Rules 785:25-7-8).

Liability and Immunity
Dam owners are not relieved of any liability related to dam construction and maintenance (OS 110.6). Owners of dams have the responsibility to provide for the safety of such works by making any necessary changes to put the works in a safe condition (Rule 785:25-3-2).
Title 51.05 Supp. 1990 Section 155 exempts the State from liability if a loss or claim results from inspection power including the failure to make an inspection or the completion of an inadequate or negligent inspection.

Definitions/Dam Classifications
*Dam* means any artificial barrier, together with appurtenant works, which does or may impound or divert water (Rules 785:25-1-2). A dam is regulated if it is 25 feet or more in height or has an impounding capacity of 50 acre-feet or more. Minimum spillway performance standards and technical information are outlined in these rules, requiring owners of dams who do not meet the standards to make the necessary changes in order to reach compliance. Standards may be adjusted on a case-by-case basis. Probable maximum flood volume are anticipated and accounted (Rules 785:25-3-1[6]). Rules 785:25-3-5 and 785:25-3-6 establish minimum design standards as well as minimum spillway performance standards which all dams are required to meet. *Dam height* is measured from the natural bed of the stream or watercourse at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier if it is not across a stream channel or watercourse, to the maximum possible water storage elevation.
Dam classifications are based on size of the structure and the extent of potential hazards downstream. Hazard potential classifications may change as the area downstream develops; dams may be reclassified from time to time. The Board shall notify dam owners of such reclassification and may order such modifications necessary to meet the more stringent standards. Hazard classifications may also be downgraded (Rules 785:25-3-3). Hazard classifications are as follows:

### Size Classification

<table>
<thead>
<tr>
<th>Size</th>
<th>Maximum Storage (ac-ft)</th>
<th>Maximum Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>less than 10,000</td>
<td>less than 50</td>
</tr>
<tr>
<td>Intermediater</td>
<td>between 10,000 - 50,000</td>
<td>between 50 - 100</td>
</tr>
<tr>
<td>Large</td>
<td>greater than 50,000</td>
<td>greater than 100</td>
</tr>
</tbody>
</table>

### Hazard Potential Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Loss of Life</th>
<th>Economic Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>Low</td>
<td>none</td>
<td>minimal</td>
</tr>
<tr>
<td>Significant</td>
<td>none</td>
<td>appreciable</td>
</tr>
<tr>
<td>High</td>
<td>yes</td>
<td>excessive</td>
</tr>
</tbody>
</table>

- **Abandonment**: Not defined.
- **Engineer**: Registered professional engineer.
- **Hazard Potential**: Not defined.
- **Operator**: Not defined.
- **Owner**: Any person who, jointly or severally, owns, controls, maintains, manages, or proposes to construct a dam or reservoir, and includes those shown by records of the county registrar of deeds to have some interest, fee, easement or otherwise, in the land on which the dam and lake lie and may also include persons who may derive a direct pecuniary benefit from the existence of the lake.
- **Person**: Any individual, firm, partnership, association, corporation, any trust formed for the benefit of an individual business or any public entity, federal agency, state agency, the State or any political subdivision thereof, municipalities, and any other legal entity.
- **Repairs**: Only such repairs as may affect the safety of a dam or reservoir.
- **Spillway**: Not defined.

### Program Funding

The Board will typically bill dam owners for any State actions required under State dam and reservoir laws. Fees for any scheduled Board inspections during construction, alteration, enlargement, or removal shall be paid by the owner upon submission of an itemized bill by the Board. Fees not paid by owner within 30 days may force the Board to place a lien against any property of such owner, recoverable by the District Attorney (Rules 782:25-7-2).

### Fees and Costs

The owner is required to pay all scheduled application fees and all inspection fees for dams found to be unsafe, and is responsible for any remedial work (Rules 785:25-9-5, 7). A filing fee must be submitted with each application to construct, enlarge, alter, or repair a dam, based on estimated cost of construction (Rules Chapter III 305.5).

**Estimated Cost Filing Fee**

- $20,000 or less - $100.00
- $20,001-$99,999 - $200.00
$100,000-$999,999 - $500.00
$1,000,000 or more - $1,000.00

The cost and expenses of the remedial means, including cost of any work done to render a dam safe, shall be recoverable by the State from the owner by action brought by the Board in the district court of the district wherein the dam is situated (Rules 785:25-9-5). Owner is not responsible for fees incurred during non-periodic, unscheduled inspections, such as those during emergency or upon complaint, provided that no violations are found (Rule 785:25-9-1).

**Permit/Approval Process**

(OS 110.8) Certifications of completion are required before water can be impounded in any new dam or at any elevation higher that previously authorized at an existing dam that has been modified. Certification shall include date of plans/specifications approval, date construction was completed, and other conditions required by the board. Owners must give the Board notification upon work completion.

Owners may apply for a variance or waiver to the rules if cost of compliance without such variance would impose significant expense without providing for additional safety, provided that the Board may require engineer certification to ensure to adverse affects to dam integrity (Rules 785:25-1-4).

Plans and specifications are to be prepared by a registered professional engineer, unless waived by the Board (Rules 785:25-5-2). Any subsequent work shall be under the responsible charge of such engineer (Rules 785:25-7-4).

Applicants for a permit must submit an application upon pre-printed forms, which will be furnished by the Board upon request. The maps, plans, drawings, and specifications of the proposed work along with the filing fee shall form part of the application and must be signed and notarized according to the Rules. Duplicates must be attached. Water rights must also be requested or obtained prior to Board approval (Rules 785:25-5-1, 3).

In addition, an engineer's report giving details necessary for analysis of the structure and appurtenances shall be submitted with the plans and specifications (Rules 785:25-5-4). After an application has been filed, a notice will be prepared by the Board setting forth the time, date, and place for hearing the application. Notice requirements are set forth in the rules, covering duration, venue, and contents of public notice. Protests regarding the application may be heard at this time (Rules 785:25-5-5, 6, 7). The Board will then render its decision according to the approval or denial provisions set forth in the Rule 785:25-5-8.

(Rules 785:25-7-3) Owners may be required to submit revised or amended applications if deficiencies are found upon Board inspection. Prior approval can be revoked. Prior approved plans and specifications may be modified after approval by the Board, with consideration to any parties interested in the original approval (Rules 785:25-7-5).

**Inspection Process**

(State)

Supervision over the maintenance and operation of constructed dams and reservoirs insofar as necessary to safeguard life and property is vested in the Board (Rules 785:25-9-1). The rules give the Board responsibility for carrying out routine inspections of every dam under their jurisdiction. Federal dams supervised by the U.S. are not to be inspected. The Board shall notify owners when the date of the periodic inspection is due. The owner will then respond with a specified inspection date. Failure to reply is a violation. (Rules 785:25-7-2) During construction, alteration, or removal, periodic inspections may be performed by the Board at owner’s expense, and the owner may be required to perform the necessary tests or works for the Board to determine substantial conformity with approved plans and specifications.
Appendix E

(OS 110.5) Periodic inspections shall be at the owner’s expense (except for low hazard periodic inspections – which may be inspected by persons other than Registered Pro. Engineers but who are trained in inspecting dams) and shall be conducted by a Registered Professional Engineer hired by the owner who has dam training and/or experience, or by an engineer with a U.S. agency. Unscheduled (non-periodic) inspections, such as those conducted in response to a complaint or in emergency situations, shall be conducted by Board staff. No fees are due for unscheduled (non-periodic) inspections, provided that no violations are found and the dam is found to be safe (Rules 785:25-9-1). Periodic inspections of dams shall be scheduled according to hazard classification as follows:

- High Hazard - At least once annually
- Significant Hazard - At least once every three years
- Low Hazard - At least once every five years

Costs and expense incurred by the Board for inspecting a dam are the responsibility of the owner. A lien shall be placed on the property if the owner does not pay within 30 days of the Board's decision and expenses shall be recovered by suit (Rules 785:25-7-2). The Board shall issue a certificate of completion after conducting or causing a dam inspection, and after receipt of applicable filing and inspection fees. No certificates shall be issued until after outstanding fees are paid. Board decisions are binding upon all State agencies as to the safety of the dam. After the issuance of a certification of completion, the Board shall provide notice to owner upon revocation or modification of the previous Board certificate (Rules 785:25-7-8).

[Owner]

During the construction, enlargement, repair, alteration, or removal of any dam, periodic inspections may be made by the Board and the owner shall be required to perform at his expense such works or tests as necessary to disclose information sufficient to enable the Board to determine that substantial conformity with approved plans and specifications is being secured (Rules 785:25-7-1). Periodic inspections shall be conducted by Board staff, a registered professional engineer, or an engineer of any United States governmental agency acting in his official capacity. If a periodic inspection is conducted by the owner or his/her representative, a written report must be submitted to the Board, containing at a minimum the information required by the Board’s inspection report, in similar format (Rules 785:25-9-1). Rule 785-25-9-2 requires the owner or his agent to "fully and promptly advise the Board of any sudden or unprecedented flood or unusual or alarming circumstances or occurrence affecting the safety of the dam or reservoir".

Right of Entry
Not explicitly addressed.

Operation and Maintenance
When there is more than one owner of a dam, the Board shall consider all owners responsible for the safety of such dam, unless evidence shows otherwise. New owners must notify the Board upon transfer of ownership (Rules 785:25-3-2).

(OS 110.9) Owners must give timely notice to the Board of flood events or other circumstances that may affect the integrity or safety of the dam.

No construction is allowed on a dam or spillway structure or within 50 feet from the line where the dam or spillway meets the natural grade without authorization from the Board proving it will not affect the safety of the dam (Rules 785:25-3-9). Trees and vegetation shall be removed from the slopes and crest of earthen dam embankments and spillway area, as well as within thirty (30) feet from the bottom of the embankment (Rules 785:25-3-10).


**Emergencies/Emergency Action Plans**

The Board has the power to immediately employ remedial measures in the event of a dam emergency (Rules 785:25-9-5). The Board may, without notice and hearing issue an emergency order requiring remedial measures to be taken necessary to protect life and property. If the owner cannot be served or is otherwise unable to act, the Board may immediately employ remedial measures. In applying remedial measures, the Board may in emergency do or cause to be done any of the following:

(a) Lower the water level by releasing water from the reservoir,

(b) Completely empty the reservoir, or

(c) Take such other steps as may be essential to safeguard life and property.

Rule 785:25-7-7 requires owners of existing or proposed dams classified as high hazard to provide an adequate warning system and evacuation plan to protect downstream lives and property. The plan is to be approved by and filed with the local Civil Defense authorities. The plan must also be filed with the Board.

If conditions exist that warrant immediate action, a dam owner may take such action without Board approval. The Board must be notified of such action within 48 hours of such work, with plans and specifications attached (Rules 785:25-9-8).

**Owner Non-Compliance/Violations/Penalties**

OS 110.10 provides that upon (owner) non-compliance with this act, the Board may issue orders requiring necessary actions, including leveling or removal of water, providing an adequate warning system downstream, dam repair and modification, cessation of construction, and implementation of an operation and maintenance plan. If dam poses imminent peril to public health and welfare the Board may take control of the dam, without notice or hearing, and take necessary action to place the dam in safe condition; such orders must specify hearings for a later date.

Every person shall be guilty of a misdemeanor who violates any of the provisions of the laws or of any order, rule, or regulation of the Board issued pursuant thereto, where a copy of the order, rule, or regulation has been served upon said person by certified mail and said person fails to comply therewith within the time provided, or within ten days of such service if not otherwise provided. In the event of a continuing violation, each day that the violation continues constitutes a separate offense. The Board may also impose administrative penalties for noncompliance, only after notice and opportunity for hearing (Rules 785:25-1-3, 11-3). Penalties are determined according to nature, duration, and previous violations, owner efforts to correct such violations, cost of remediation, size and classification of the dam, and other factors deemed necessary by the Board (Rules 785:25-11-3).

OS 110.10 also states that administrative penalties – not exceeding $500.00 per day – may only be imposed after a hearing. Judicial relief may be sought to enforce these rules in the district court in which the dam is located. If there are multiple dam owners, the Board need only notify one of proceedings involving the dam.

Appeals are available (OS 110.11).

The Board may revoke any approvals during or after dam construction if deficiencies are noted. Such revocation shall be accompanied by a report specifying reasons for approval revocation (Rules 785:25-7-3).

**Recordkeeping**

(OS 110.9) Owners of dams are responsible for keeping accurate records pertaining to the design, construction, operation and maintenance of their dams and to make the same available upon request by the Board.
(OAC 785:25-9-2) The Board may require owners to keep records of dam maintenance and staffing if necessary. Owners must file a notice of completion with the Board describing any items that affect safety and performance of the dam (785:25-7-6). Owners must also comply with the recording provisions outlined in the “Permit/Approval Process” section.

Oversight
As allowed by and subject to compliance with the requirements imposed under the Oklahoma Administrative Procedures Act, any interested party may request rehearing, reopening or reconsideration of any final Board action, decision or Order (Rule 785:4-9-3). Appeals of orders issued by the Board pursuant to this act, except emergency orders, shall be done according to State Administrative Procedures (OS 110.11).

Miscellaneous
Oklahoma Statutes (Section 110.20) creates a Water Supply and Flood Impact Task Force to study and review the hydrological characteristics of a certain waterway. This is an option to consider for those waterways under considerable strain and warranting additional protection.

a. Complaints to Unsafe Conditions
- Third parties may request a dam to be inspected by the Board, after depositing the estimated cost of inspection. If violations are found after a request inspection, the deposited monies shall be returned to complaint (Rules 785:25-9-6).

b. Environmental Impact
- Not explicitly addressed, though the purpose of dam safety legislation is to ensure the safety of dams and reservoirs used for many purposes, including fish and wildlife.

c. Severability
- Not addressed in the dam safety laws.

d. Supplemental Reference Materials
- In determining the design and integrity of dams, the Board shall review the dam design and engineering manuals published by the U.S. Department Interior Bureau of Reclamation, U.S. Department of the Army, Corp. of Engineers, and the U.S. Department of Agriculture, Natural Resources Conservation Service, or equivalent recommendations (Rule 785:25-3-4,5).
OREGON

Summary
[Pros] To allow free passage of natural streamflow, the Water Resources Commission may require dam owners to construct and maintain a suitable outlet in the reservoir or diversion dam. The Commission is authorized to employ outside consulting engineers, geologists, or other specialists upon finding that dam owners' submitted reports are insufficient. The Water Resources Director may require any information necessary to determine the safety of a dam. Conditions and limitations may be placed on a permit for construction for the life of that water right instrument. Rainfall and runoff records must be submitted to the Commission whenever possible, to determine plan approval.

[Cons] The Oregon dam safety statute and regulations are short, vague, and somewhat difficult to extrapolate from other water resource issues also found within the laws. The laws and rules do not specify whether or not a professional engineer is required to conduct the inspections, only that the engineer must be licensed in Oregon. The dam safety laws do not establish a fee schedule or program funding mechanism. Any 'right of entry' provisions are implicit, at best. No emergency action plan is required.

Citation and Title
[Administrative Agency] Oregon Water Resources Department, Water Resources Commission

Jurisdiction/Powers of Department
The Water Resources Department (the Department) has the power to review the plans for the construction, enlargement, repair, or alteration of dams (Rules 690-20-035, effective 2/18/77). The Department's responsibility for the safety of Oregon's dams is not clearly stated. The Director of the Department (the Director) has the power to order inspections "on his own motion", per ORS 540.390. ORS 537.130 gives the Director the power to issue permits for the right to appropriate any waters. The Department's power to adopt rules and regulations is not clearly stated. ORS 540.360 empowers the Director to order modifications he deems necessary to "insure the safety of the works with reference to possible damage to life or property." ORS 540.320-540.380 gives the Director the power to cite non-compliance and seek judicial remedies to force compliance. It is not clearly stated that the State has the power to take over the dam in the event of an emergency.

(ORS 540.380) The Commission may accept the reports of consulting engineers, geologists, or other specialists whom the owner of the works in question has employed. But, if for any reason, the Commission considers the reports insufficient, the Commission may employ consulting engineers, geologists or other specialists outside the Department to make special examinations, inspections, and reports. The cost of such special arrangements shall be paid by the Commission from any funds available to the Commission, or it may be divided by mutual agreement between the state and the owner(s).

Liability and Immunity
The laws and regulation do not contain provisions for liability on the part of the owner or State.
Definitions/Dam Classifications

*Dam* is not defined in the laws or rules. *Dam height* is not defined in the laws or rules. *Dam hazard classifications* are not defined in the laws or rules. However, dams are classified as either “Small Dams, Recommended Minimum Standards”, or “Dams Over the Statutory Limits; Minimum Engineering Requirements.”

[Small Dams] – Less than 10 feet in height, or impoundment capacity less than 3,000,000 gal (9.2 acre-feet) (OAR 690-020-0029).

A spillway channel is required. All vegetation must be cleared from the area occupied by the dam. Embankment material is also regulated.

[Dams Over the Statutory Limit] – 10 feet or more in height, or impoundment capacity of 3,000,000 gallons or more (OAR 690-020-0035).

A certified engineer is required to prepare the plans and specifications for dams with height of 10 feet or more and impounding capacity of 3,000,000 gallons or more. Before initiating design, the engineer shall obtain design criteria from the Department. Written approval must be granted by the Department prior to water storage. The following must be submitted for department approval:

- Plans accurately portraying the work to scale (must be submitted on specified media: mylar or vellum)
- Map showing the township, tax lot, name and location of the stream, any government surveys, capacity tables or curves
- Map of the drainage basin, brief description of the area, percentage of bare and timbered lands, general characteristics of the watershed
  - Topographic map of the dam site and superimposed plan of the dam; showing spillways, outlet conduits, and cutoff walls
  - A cross-section and profile view of the dam, showing the appurtenant works, dimensions, and materials encountered below
- Specifications: methods of performing each classification of works; construction materials; and, a provision for supervision by the engineer during construction and Department inspection at any time during construction
  - Construction must be supervised by a licensed engineer
  - Submittal to the Department of the following: notice to begin construction; notice of intent to place fill materials; completion report with “as-built” drawings, and certificate of completion in accordance with approved plans and specifications

  a. **Abandonment**: Not defined.
  b. **Engineer**: An engineer licensed to practice in the State.
  c. **Hazard Potential**: Not defined.
  d. **Operator**: Not defined.
  e. **Owner**: Not defined.
  f. **Person**: Not defined.
  g. **Repairs**: Not defined.
  h. **Spillway**: An overflow structure constructed to bypass flood water and prevent overtopping the dam crest.

Program Funding

Not included in the dam safety statute or rules.

Fees and Costs

Not specified in the dam safety statute or rules.
Appendix E
197 Oregon

Permit/Approval Process
Rule 690-20-035 requires that all maps, plans, and specifications for the construction, enlargement, repair, or alteration of all dams which are, or will be, 10 feet or more in height and will impound 3,000,000 gallons or water or more, must be prepared by a professional engineer licensed to practice in the State of Oregon (effective 10/28/94). Rule 690-20-015 states that no application will be approved and permit issued until expiration of at least 30 days from the date of filing, except when special circumstances justify earlier action (effective 2/18/77). Rule 690-20-029 contains recommended design criteria that are provided by the Department to assist in the construction of small earthfill dams. For dams larger than the statutory limits, the engineer commissioned for the preparation of the plans and specifications should submit preliminary data to the Department and obtain the minimum requirements on which to base the design of the dam, per Rule 690-20-035. The owner is required to pay for modifications (ORS 540.360).
Permit conditions or limitations may be imposed as part of any permit for construction, operation, and maintenance and remain in effect throughout the life of the water right (OAR 690-020-0025). Outlet conduits are required in any instream reservoir to permit drainage and waterflow passage, but such requirement may be waived by the Commission upon finding that such feature is not needed for dam safety or will not benefit water flow (OAR 690-020-0029).

Inspection Process
(ORS § 540.350; OAR 690-020-0039) The Director will maintain a program of inspecting existing hydraulic structures. The commission may make inspections of any hydraulic structure, the site thereof, and of the plans and specifications, and any other features involved in the construction, maintenance and operation of the works. If the Commission considers any modification necessary to insure the safety of the works in regards to possible damage to life or property, the commission shall notify the owners by registered or certified mail.
No person shall construct any dam, the failure of which the Director finds would result in damage to life or property, unless the Director has made an examination of the site and of the plans and specifications and other features involved in the construction of such works, and has approved them in writing (ORS 540.350).
The laws and rules do not specify whether or not a professional engineer is required to conduct the inspections.
If a person residing on or owning land in the neighborhood of any dam after completion, or in the course of construction, applies to the Director desiring an inspection of the works, the Director may order an inspection, or he may make such order on his own motion. If the inspection is deemed justified by the Director, he may require that the owner pay all or part of the expenses for the inspection (ORS 540.390).
The laws and rules do not specify the frequency of the inspections.

Right of Entry
Not explicitly granted.

Operation and Maintenance
The Director may require any information in addition to that prescribed herein necessary to determine the safety of a dam. Whenever possible, precipitation or rainfall and runoff records shall be submitted (OAR 690-020-0025).

Emergencies/Emergency Action Plans
If the Director determines that the present or proposed release of stored water from an impoundment or diversion structure results in rapid increase in the stream level below the structure which creates or will create a hazard to human life or property, the Director shall cause
written notice of such determination to be mailed to the owner or operator of the structure (ORS 541.515).

The laws and regulations do not specifically require an owner to have an Emergency Action Plan. The Director can condition a Permit for new construction to include an Emergency Action Plan; however, no such opportunity is available for existing structures whose hazard rating may have increased in the time since its initial construction/permitting.

**Owner Non-Compliance/Violations/Penalties**
In the case of non-compliance, the Director shall direct the watermaster or other authorized assistant to carry out the orders, or he may file a copy of his order with the Attorney General or with the district attorney of the county within which the works are located. The Attorney General or district attorney shall bring proceedings in the name of the State. The court, after a full hearing on the matter, may declare the works a nuisance and order their removal, or order any repairs or alterations, and may enforce its orders in the manner provided by law (ORS 540.370). Revocation of permits is another enforcement option (OAR 690-020-0029).

Upon inspection, when any structure is found to be in violation of the terms and conditions of the permit or certificate of approval, or when the structure poses a threat to life or property, or when lack of maintenance or unauthorized alterations could lead to a direct threat of life or property, the Department shall issue a notice in writing of the actions necessary to bring the structure up to design, maintenance, or operation standards. Failure by the owner to do so may result in: notice and opportunity for hearing; permit cancellation; posting of the structure to prevent storage or limit operation; instituting legal action by the district attorney or attorney general; issuance of an order to breach embankments; or any other enforcement action authorized by law (OAR 690-020-0039).

**Recordkeeping**
Addressed in other sections.

**Oversight**
Appeals may be made to contest an order of the Department in the district court of the county in which the dam in question is located (ORS 540.370).

**Miscellaneous**

a. **Complaints to Unsafe Conditions**
- (ORS 540.390) Any person residing on or owning land in the neighborhood of any dam may apply to the Commission in writing desiring an inspection. Before doing so, the Commission may require the applicant for inspection to deposit a sum of money sufficient to expense the requested inspection. If the complaint/application is unfounded, the Commission may keep the deposit. If the complaint is found to be valid, the Commission may require the owner of the works to expense the inspection and any required remedial works.

b. **Environmental Impact**
- The dam safety laws and rules do not specifically address environmental impact.

c. **Severability**
- The dam safety laws and rules do not specifically address severability.

d. **Supplemental Reference Materials**
- The dam safety laws and rules do not specifically address supplemental reference materials.
PENNSYLVANIA

Summary
[Pros] Dam safety laws are very comprehensive. In promulgating regulations, the Department or Board must consider available technologies and scientific data, economic impact on citizens of the State, relationship between the facility and affected waterways, and environmental impact. The “Definitions” section in the Rules is very thorough. The “Inspections” provisions are stringent, including ongoing monitoring, and investigations when necessary. These rules apply to all dams used for the storage of fluids or semifluids other than water, the escape which may result in air, water, or land pollution, or may result in danger to persons or property. The rules also apply to all water obstructions or encroachments, temporary or permanent, which fall under jurisdiction, not just “dams”. The “waiver” provisions are extensive: many structures are judiciously waived under Pennsylvania law. The Board may develop fees to reimburse State costs for application processing, periodic inspections, and use and occupation of submerged lands. The Board may also establish monitoring requirements, standards, and most other program specifications, taking into consideration best available technologies, watershed impact, best available preventative measures, long and short-term economic impact, and the impacts of water obstructions and encroachments upon the water quality and environment. Permits to conduct any works (i.e. construction, alteration, removal) require a thorough application process and shall be a matter of public record. Public hearings may be held at the discretion of the Department. In addition to those required for the aforementioned works (i.e. construction, alteration, removal), permits are also required for the operation and maintenance of dams or reservoirs. Operation and maintenance plans must reflect the permit conditions; dam owners or operators must follow the operation and maintenance procedures approved by the Department and may not cease or modify such procedures without Department approval. Spillways that may safely handle the design flood (a specified discharge of water for which the hydraulic capacity of a structure is designed; represents the largest flood that need be considered in evaluation of the given project) of a dam without compromising dam structural integrity are required for all regulated dams. Permits are also required for projects affecting submerged lands of the State, as may be easements or right-of-ways. Dams built in subdivisions must include in their permits conditions precluding owners from building structures on lands possibly subject to flooding, and conditions requiring such owners to adequately inform potential buyers or lessees of the restrictions. The Department shall establish a system to coordinate the application for and issuance of permits issued by other State or Federal agencies or under other statutes and regulations administered by the Department. The owner must notify the Department prior to storing water in the reservoir or pond, and must allow sufficient water flow into the stream to support aquatic life and fish, and to preserve water quality. Water release rates shall be determined (and modified) by the Department, taking into account many factors relevant to water flows. Prior to application approval, owners must demonstrate proof of financial capability to perform all actions required under these laws.

The emergency action provisions are strong. Emergency action plans (EAP) are required for those dams deemed to cause potential loss of life or serious property damage upon failure. The rules regulating “unsafe dams” are also strong. With administrative oversight, the State may delegate its powers under these laws to county agencies. The enforcement and owner non-compliance provisions are facially strong, providing both civil and criminal sanctions, as well as property liens – personal and real – for nonpayment of penalties. The oversight provisions are also more complete than many other states’. No permits issued under these laws may give real or personal property rights nor grant exclusive privileges, nor may construed to confer a right, title, easement, or interest in, to, or over lands.
belonging to the State. Applicants must demonstrate property right-of-way or ownership of submerged lands prior to permit approval, including use or control of the space overlying submerged lands (i.e. the reservoir or water).

A subchapter (K) is designated to the “Dams and Encroachments Fund” which provides an account to redistribute towards administration of the dam safety program any revenue generated by program fees, fines, and owner reimbursements.

[Cons] The applicable rules are spread throughout three (3) subdivisions, and one (1) statute, requiring diligent effort to understand all applicable laws. EAPs may be needed for all regulated dams, including those that may cause moderate property damage.

**Citation and Title**


[Rules/Regulations] Rules pertaining to dam safety are found in Title 25-Rules and Regulations; Part I-Department of Environmental Resources; Subpart C-Protection of Natural Resources; Article II-Water Resources; Chapter 105-Dam Safety and Waterway Management ("the Rules"), Subchapter A-General Provisions, Subchapter B-Dams and Reservoirs, and Subchapter K-Disbursements of Monies from the Dams and Encroachments Fund-adopted Sept. 16, 1980.

Rules have been supplemented by subsequent policy statements, which are incorporated into Chapter 105. Note: A complete revision of the rules was completed in 1991. Further revisions to the rules are planned.

[Administrative Agency] Department of Environmental Resources (Department), Environmental Quality Board (Board)

**Jurisdiction/Powers of Department**

The Environmental Quality Board has the power to adopt rules and regulations for the design, construction, operation, monitoring, maintenance, modification, repair and removal of dams and reservoirs, water obstructions and encroachments as are necessary and proper to carry out the purposes of the law. The Board shall also establish rules on water management and watershed impact from developments. Such laws shall consider the state of scientific and technological knowledge at the time. The Board may also establish reasonable fees for application processing and periodic inspections, for the purpose of reimbursing state costs to administer these rules (DSE Act Section 5).

The Environmental Quality Board may, by regulation, waive the permit requirements for any category of dam, water obstruction, or encroachment, which it determines has insignificant effect upon the safety and protection of life, health, property and the environment (DSE Act Section 7). Express waivers include: wetlands located in a floodway, dams not exceeding three (3) feet in height in stream under fifty (50) feet in width, aerial wire or cable crossings over non-navigable waters, dams otherwise permitted and regulated by the Mine Safety and Health Administration.

DSE Act Section 2 states that the purpose of the regulations is to: (1) provide for the regulation of dams and reservoirs; (2) assure proper planning, design, construction, maintenance, monitoring, and supervision of dams and reservoirs, including such preventative measures as are necessary to provide an adequate margin of safety; (3) assure proper planning, design, construction, maintenance, monitoring, and supervision of dams and reservoirs, including such preventative measures as are necessary to prevent unreasonable interference with waterflow and to protect navigation; (4) protect natural resources, environmental rights, and values secured by the State Constitution, and preserve water quality, natural regime, and carrying capacity of watercourses. Dams built prior enactment of these rules need only comply with the operating, maintenance, monitoring, and other requirements of these laws, excluding those pertaining to construction.
Such works must be conducted within the original specifications or after Department approval (§693.6).

The Department is authorized to enter any property, facility, operation or activity at all reasonable times in order to make inspections, conduct tests or sampling, or examine books, papers and records pertinent to any matter under investigation (DSE Act Section 16). The Department has the power to cite non-compliance and seek judicial remedies to enforce its regulations (DSE Act Section 20, 21). If the condition of the facility is so dangerous as to require immediate remedial action, the Department or its authorized agents may enter and conduct such investigations, tests and analyses or take such corrective action as required to carry out the purposes of the law (DSE Act Section 14(c) (3)).

The Department may establish the minimum requirements for persons responsible for preparation of plans, design analysis, and supervision of construction, operation, inspection and monitoring activities (§693.10).

The Department may delegate – through agreement – to other county agencies its regulatory functions to permit, inspect, and monitor, and to enforce its functions under these laws. Any such county agency shall be granted the same powers and duties otherwise vested in the Department (§693.17, Rules 105.4). The Department shall oversee such agency actions. A grievance process for this delegation of powers is provided. The Department shall coordinate efforts with the U.S. Army Corps of Engineers and other appropriate Federal or interstate agencies (§693.17).

No permits issued under these laws may give real or personal property rights nor grant exclusive privileges, nor may construed to confer a right, title, easement, or interest in, to, or over lands belonging to the State. No permits shall be issued for a dam, encroachment, or water obstruction to occupy submerged lands of the State until the applicant has obtained the proper easement, right-of-way, licenses, or lease from the appropriate State agency. The placement of a physical structure on, under, or over submerged lands of this State constitutes occupation of such lands, as shall use or control of the space overlying submerged lands of the State in a manner that substantially restricts or prevents navigation, fishing, recreation, or other public trusts uses by the public (Rule 105.31).

**Liability and Immunity**

Pursuant to provisions in Section 13 DSE, the owner of a dam has the legal duty to monitor, operate, and maintain the facility in a safe condition in accordance with the regulations, terms and conditions of permits, approved operating plans and orders of the department issued pursuant to this act. Additionally, owners are required to immediately notify the Department and responsible authorities in downstream communities of any condition which threatens the safety of the facility, and take all necessary actions to protect life and property, including any action required under an emergency action plan or Department order issued pursuant to the law (DSE Act Section 13(3)). (DSE Act Section 11) Proof of financial responsibility, or security assuring the proper construction, operation, maintenance, and termination is required for permit approval under these laws. Such proof or security may be any of the following: (1) Certificate of Public Convenience from the Public Utility Commission if the owner of the proposed facility is subject to regulation under the “Public Utility Law”; (2) ownership or management of the facility by an agency of the Federal, State, interstate, county, or municipal government; (3) a bond or other legal device acceptable to the Department, payable to the State, which guarantees proper construction, repair, operation, maintenance, inspections, and monitoring of the facility and removal, if necessary. The amount of such shall be sufficient to cover all costs of entry, correction, repair, operation, maintenance, inspection, monitoring, or removal of the facility by the State in the event of owner non-compliance with the provisions of these laws, any regulation, permit, or order issued hereunder.
Definitions/Dam Classifications

A dam, as defined in Rule 105.1, is any artificial barrier, together with its appurtenant works, constructed for the purpose of impounding or storing water or any other fluid or semifluid or any refuse bank fill, or structure for highway, railroad, or other purposes which does or may impound water or any other fluid or semifluid. 

Dam height is the measurement expressed in feet as measured from the downstream toe of the dam at its lowest point to the elevation of the top of the dam (Rule 105.1).

Dam classifications, found in the Rule 105.91, are based on size and hazard potential:

Size Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Impoundment Storage (ac-ft)</th>
<th>Dam Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>50,000 or more</td>
<td>100 or more</td>
</tr>
<tr>
<td>B</td>
<td>&lt; 50,000 but &gt; 1000</td>
<td>&lt; 100 but &gt; 40</td>
</tr>
<tr>
<td>C</td>
<td>1000 or less</td>
<td>40 or less</td>
</tr>
</tbody>
</table>

Hazard Potential Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Loss of Life</th>
<th>Economic Loss</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>substantial</td>
<td>excessive</td>
</tr>
<tr>
<td>2</td>
<td>few</td>
<td>appreciable</td>
</tr>
<tr>
<td>3</td>
<td>none expected</td>
<td>minimal</td>
</tr>
</tbody>
</table>

a. Abandonment: Not defined
b. Engineer: A competent engineer approved by the Department; a registered professional engineer experienced in dam design and construction.
c. Hazard Potential: Not defined
d. Operator: Not defined
e. Owner: Any person who owns, controls, operates, maintains or manages a dam or reservoir, water obstruction or encroachment.
f. Person: A natural person, partnership, association, corporation, public utility (defined), municipality, municipal authority, political subdivision of the Commonwealth (a county, city, borough, incorporated town, township, school district, authority or other governmental unit or combination thereof), receiver or trustee, and a department, board, commission or authority of the Commonwealth.
g. Repairs: Not defined.
h. Spillway: A device that safely conveys the design flood (a specified discharge for which the hydraulic capacity of a structure is designed) without endangering its safety or integrity.

Program Funding

(§693.26) All fines collected under the penal provisions of this act and all civil penalties collected under this act shall be paid to the State Treasury in a special fund known as the “Dams and Encroachments Fund”.

(Rule 105.431) Subchapter K-Disbursements of Monies from the Dams and Encroachments Fund establishes an account for deposits of revenues generated from dam safety program administration, fees, fines, and other. The “Fund” provides the Department monies for investigations, corrective actions, purchase of materials and services, litigation costs, and other expenses attributed to administration of the dam safety program.

Funds may be disbursed at the discretion of the Department to eliminate hazards to life, property, and the environment, and shall be available for use by the Bureau of Dams and Waterway Management in addition to funds otherwise available to it.
Fees and Costs
All fees, inspection costs, and any remedial work expenses are to be paid for by the owner.
(DSE Act Section 5) The Board is authorized to establish reasonable fees for application processing and periodic inspections, for the purpose of reimbursing state costs to administer these rules.
Each application for a permit for a dam is to be accompanied by a check in accordance with the following schedule: Class A - $3,000, Class B - $2500, Class C - $1500 (Rule 105.13). Other project fees are assessed according to the type of water obstruction or encroachment: Stream enclosures - $350, Channel changes - $300, Commercial dredging - $300, Peat extraction - $750, Fills, levees, floodwalls - $350, Bridges and other water obstructions or encroachments - $200, Small projects - $100.
Fees are also charged to commercial utility and other dams, water obstructions, and encroachments, for use and occupation of submerged lands: (i) Areas occupied by facilities - $50 per tenth of an acre; (ii) For barge fleeting and mooring areas - $10 per tenth of an acre; (iii) Minimum annual charge - $250. Fees are also required for public service lines crossing or occupying submerged lands of the State. Fees are excluded for, among other things, facilities used to provide access to the general public to water for recreation where access is without charge (Rule 105.35).
Owners shall reimburse Department costs for any emergency works, investigations, tests, and analyses done on their dams upon owner refusal to act or upon Department discovery of imminent threat to public health or property (§693.14). Violators shall also reimburse any litigation costs incurred during civil actions (§693.19).

Permit/Approval Process
Section 6 of the DSE Act states that "no person shall construct, operate, maintain, modify, enlarge or abandon any dam, water obstruction or encroachment without the prior written permit of the Department". The Department may issue a permit if it determines the project complies with all provisions of this act and all other applicable laws administered by this Department or other river basin commission. Permits may be issued even when proposed structures or activities are not compliant with applicable laws, but restoration may pose a more imminent threat or extraordinary circumstances warrant permit issuance (Rule 105.21). The Department shall also consider, among other things: application completion; potential threats to life and property; potential threats to safe waterway navigation; effect of dam or encroachment on downstream or upstream owners’ property rights; ecological impact; compliance with other applicable laws; access to the waterway; impact on other projects in the area; and future development in the area. Permit conditions may be imposed by the Department regarding project construction, operation, maintenance, inspection, and monitoring (§693.9). Applicants must approve in writing of all permit conditions (Rule 105.42). The Department may set time limits for commencement and completion of the work, wherein if not completed may result in permit cancellation (Rule 105.43), or removal of all or any portion of the completed work (Rule 105.47). Permit applications must include, among other things, complete maps, plans, specifications, test reports, color photos, plans for permanent performance monitoring, proof of title or adequate flowage easements for land area subject to inundation, and other information required by the Department. Permits shall be a matter of public record. Public hearings may be held at the discretion of the Department (§693.8, Rule 105.13). Incomplete or denied permits shall be returned to the applicant, who may make changes requested and resubmit for approval, unless withdrawn by applicant or not resubmitted within sixty (60) days (Rule 105.19).
At least two permits are required for initial dam construction and ongoing operation. Dam owners are required to first obtain a permit for construction or modification of the dam. A separate permit application is to be made for the operation and maintenance of the dam (Rule 105.81, 82). These
provisions also allow for separate permit requirements for dams built before and after enactment of state dam safety laws.

All plans and specifications and the results of any tests or investigations shall be prepared under the supervision of and certified by a registered professional engineer experienced in dam design and construction and assisted by qualified engineers, geologists, and other specialists, when necessary (Rule 105.81 (d)).

Specific spillway design criteria is not required by law; however, Rule 105.94 requires all dams to be provided with a spillway system which is capable of safely conveying the design flood of the dam without endangering the safety or integrity of the dam. Also Rule 105.98 specifies the design flood criteria for the size and hazard potential classifications of a dam as determined by Rule 105.91.

Dam or reservoir foundation, design stress, freeboard (the vertical distance between the water surface elevation experienced during maximum water height and the crest or the dam levee or other embankment), outlet works, structural stability, and design flood criteria must all be considered during Department approval process (Rule 105.92 -.97). Dams must include outlet works (a device to permit the draining of the reservoir within a reasonable time) that will dissipate water energy flow without endangering the safety or integrity of the dam or the natural environment of the stream (Rule 105.96).

Dams built in subdivisions must include in their permits conditions precluding owners from building structures on lands possibly subject to flooding, and conditions requiring such owners to adequately inform potential buyers or lessees of the restrictions (Rule 105.99).

Dam construction must be conducted under oversight and supervision of a competent engineer certified by the Department (Rule 105.102). Construction must be done in a manner to minimize air and pollution (Rule105.106), limit erosion and sedimentation of waterways (Rule 105.46), and properly manage waste materials (Rule 105.46a).

Permittee shall submit to the Department, within thirty (30) days of construction completion, a certified statement signed by the supervising engineer that the project was completed according to permit conditions and project specifications. Within ninety (90) days, an “as built” plan, showing any changes to approved plans, must be submitted (Rule 105.107).

Prior to the approval of any permit for construction or modification of a dam that may present a substantial potential risk to life or property, the Department will require proof of financial responsibility or security for continued operation and maintenance during the lifetime of the facility (Rule 105.20). This requirement applies to, but is not limited to, Class I dams as defined in Rule 105.91. As “proof” the Department may require one or more of the following: (1) Certificate of public convenience from the Public Utility Commission; (2) Federal, state, county, or municipal government ownership; or, (3) a bond or other legal device of form acceptable to the Department, sufficient to cover all necessary costs of owner or department remediation or compliance.

Permits are required for projects affecting submerged lands of the State; subject to grant of an easement, right-of-way, license, or lease to occupy such submerged lands (§693.15).

The Department may waive permit requirements for any category of dam upon determination that waived structure has insignificant impact upon the safety of life and property, and the environment (§693.7). The Department may also issue general permits on a regional or statewide basis, if determined that such projects are so similar in nature as to allow for such consolidation. The owner must notify the Department prior to storing water in the reservoir or pond, and must allow sufficient water flow into the stream to support aquatic life and fish, and to preserve water quality (Rule 105.112).

Prior to discontinued use or abandonment, dam owners have the duty to remove all or part of the facility to protect public safety and environmental health (DSE Act Section 13).
The Department shall establish a system to coordinate the application for and issuance of permits issued by other State or Federal agencies or under other statutes and regulations administered by the Department. When possible joint application forms shall be developed to facilitate submission of information on related activities (Rule 105.24).

Upon Department approval, and without existing violations, permits may be transferred to a new owner if there is a change of ownership of the dam, water obstruction, or encroachment. New owners must comply with all provisions of the existing permit, including proof of financial responsibility and acquisition of necessary easements (Rule 105.25).

**Inspection Process**

The State is not required to make inspections. However, Section 16 of the DSE Act authorizes the Department to make inspections whenever it deems necessary. The Department inspects Category 1 and Category 2 dams annually, according to ASDSO references. Category 2 dams with no loss of life expected are inspected bi-annually. The Department is authorized to enter any property, facility, operation or activity at all reasonable times in order to make inspections, conduct tests or sampling, or examine books, papers and records pertinent to any matter under investigation (DSE Act Section 16 and Rule 105.45).

The owner of any dam shall inspect the facility and all appurtenant works at least once every three months. Also, for all Class 1 and Class 2 dams, annual reports regarding the condition of the dam, certified by a professional engineer, are to be submitted on or before Dec. 31 of each year (Rule 105.53).

(DSE Act Section 13, Rule 105.52) Owners have the legal duty to conduct periodic inspections and analyses, as reasonably required by the Department considering the type of facility and hazard class, and must submit reports to the Department (the Department may also accept equivalent reports prepared by governmental agencies).

Whenever the Department finds reasonable cause, it may order the owner to conduct any investigation, tests, and analysis as may be required to determine the continuing safety of the facility (§693.14). Investigations must be conducted by a registered professional engineer experienced in dam design, construction, operation, and maintenance, and accomplished according to Department proscriptions (Rule 105.61).

Rule 105.133 gives the Department the power to prescribe any necessary steps to preserve the structural stability and integrity of the dam and protect health, safety, and property.

**Right of Entry**

After presentation of identification and purpose for inspection by the agents or employees of the Department, owners or landowners must grant the Department free and unrestricted access to their property. Upon refusal, search warrants may be obtained. The Department is authorized to enter any property, facility, operation or activity at all reasonable times in order to make inspections, conduct tests or sampling, or examine books, papers and records pertinent to any matter under investigation (DSE Act Section 16).

To correct “unsafe dams” the Department is authorized to enter unto private property to conduct tests or carry our corrective actions if: the owner cannot be found; the owner refuses to comply with Department orders; or, facility conditions are so dangerous as to require immediate remedial action (Rule 105.62).

**Operation and Maintenance**

(DSE Act Section 13) Owners have duty to monitor, operate and maintain the facility in a safe condition in accordance with the laws and permits conditions. Owners have the legal duty to conduct periodic inspections and analyses, as reasonably required by the Department considering the type of facility and hazard class, and must submit reports to the Department (the Department may also accept equivalent reports prepared by governmental agencies). Owners have the legal...
duty to report to the Department and responsible authorities downstream of any conditions threatening the safety of the dam, and take all actions necessary, including those in the emergency action plan, to protect life and property.

Permittees or owners of a dam shall set up and implement monitoring systems required by the Department in the terms and conditions of the permit (Rule 105.54).

Permittees or owners shall maintain and operate the facility and appurtenant structures in a safe condition according to operation and maintenance permit terms and conditions, and all applicable laws. Owners, permittees, and operators must follow the method and schedule of operation of the dam or reservoir in accordance with procedures approved by the Department. Modification or stoppage of these approved procedures is precluded without prior Department approval, excluding normal repairs and maintenance not affecting dam or reservoir safety or integrity (Rules 105.51 & 105.131). “Directed repairs” are those prescribed by the Department, and must be immediately performed to preserve the structural integrity of the dam and to protect health, safety, and property (Rule 105.133).

Owners of “high hazard” dams shall post notices in places potentially impacted by dam failure (§693.13).

Vegetation must be cleared and removed from the dam site to minimize destruction or damage, and shall be disposed in accordance with applicable laws (Rule 105.104).

Water release rates shall be determined by the Department, and modified according to Department discretion (Rule 105.113). Such rates shall consider protection of public health, water quality control, conservation of fisheries and aquatic life, recreation, and protection of instream and downstream uses.

Preservation of aquatic life and fish shall be maintained and protected in accordance with Fish Commission requests (Rule 105.121-1123).

**Emergencies/Emergency Action Plans**

Owners of all dams and encroachments shall have the legal duty to immediately notify the Department and authorities in downstream communities of any condition threatening facility safety, and shall take any action required under the emergency action plan (EAP) or by the Department (§693.13).

The Department may take actions necessary to protect life and property upon owner failure or refusal to comply with applicable laws, or when facility conditions warrant immediate Department action (§693.14).

The owner of any dam or reservoir that may cause loss of life or serious dam to property should a failure of the dam occur shall develop an emergency action plan to be followed in the event of a dam hazard emergency. The emergency action plan shall be submitted to and approved by the Department and local emergency management officials prior to commencement of water storage. This plan shall contain, at a minimum, the following provisions: (1) identification of the area downstream that may be affected by dam failure; (2) listing of key municipal and emergency management officials and their phone numbers; (3) identification of persons needing assistance upon evacuation due to dam failure. Owners of “high hazard” dams must place notices in public places in downstream areas impacted by dam failure (Rule 105.134).

The emergency procedures, warning system, and operating plan shall be followed by dam owners or operators in actual or potential dam hazard emergencies (conditions deemed by the Department, permittee, or owner that reasonably constitute an imminent threat to life and property above or below the dam, arising from the condition of the dam and appurtenant works or extraordinary natural conditions). If such conditions exist, the Department, permittee, or owner shall immediately notify the appropriate emergency officials, and request initiation of the appropriate actions, including, but not limited to: (1) reservoir draw down; (2) dam structure reinforcement; (3) dam breach or removal; (4) debris removal; (5) repair or installation of structures necessary to assure dam stability or structure (Rule 105.135).
Emergency permits are also available upon department finding that remedial action is necessary to alleviate imminent threat to life, property, or the environment. Such permits must: be in writing; contain the conditions deemed necessary by the Department; and, include violation and punitive provisions. If the municipality in which the emergency occurs has waived notice, the emergency permit is effective immediately. If notice is not waived, the permit is effective for thirty (30) days after notice is sent (Rule 105.64).

Owner Non-Compliance/Violations/Penalties

Non-compliance with State laws or permit conditions can result in permit revocation or suspension, subject to permittee notification (Rule 105.26).

Sections 18 and 21 of the DSE Act make it unlawful for any person to violate the law or any order of the Department; this includes violations of the permit requirements or the rules, misrepresentation, and intentional obstruction of the administrative process, whether willful or not.

The Department may issue orders requiring noncompliant dam owners to cease any activity in violation of these provisions, modify, suspend, or revoke existing permits, or require compliance. Orders take effect upon notice, and may be issued in addition to any imposed penalties ($693.20).

If no appeal has been taken by the alleged violator, he will be in contempt of the order and is assessed civil penalties of not less than $100 nor greater than $10,000 per violation plus $500 for each continuing day of violation. In determining the amount of civil penalties, the Board shall consider the willfulness of the violation, damage or injury to the affected waterway and downstream State areas, cost of remediation, cost of State enforcement, and other relevant factors. Penalty assessments shall be made after hearing, unless hearing is specifically waived by the respondent ($693.21).

Penalties are collectible by any manner provided by law for debt collection. Property liens, both real and personal, are available to enforce payments, and include any costs or interests that may accrue during this time. The Board may, at any time, transmit the liens to the respective counties.

Abatement of public nuisances provided by law or equity is available for civil remedies. Suits to restrain or prevent unlawful conduct or to compel action to discontinue any unlawful conduct may be instituted in law or equity by the State (Attorney General) within thirty (30) days notice to the State, unless conditions warrant immediate remedial action. Expenses shall be recoverable from the violator ($693.13).

Owners must reimburse the Department for all State costs attributed to owner refusal or failure to comply with these laws, or costs from necessary State actions when facility conditions are so dangerous as to require immediate remedial action ($693.14).

Civil penalties are also available for any officer of any corporation, association, municipality, or county, who knowingly, willfully, or recklessly, or with gross negligence engages in any unlawful conduct as defined in this act. Any such penalty shall be in addition to and separate from any civil penalties imposed upon the corporation, association, municipality, or county. Nothing in this act shall affect the imposition of criminal penalties imposed under this act ($693.21).

Criminal penalties are available for any persons engaged in unlawful conduct as defined in this act is guilty of a summary offense under this law, and is subject to fines between $100 - $1,000 for each separate offense, and, in default of payment, up to sixty (60) days imprisonment. Persons who violate this act again within two (2) years of a conviction in a summary proceeding regarding this act shall be fined between $500 - $5,000 for each offense, is subject to imprisonment of up to one (1) year, or both. Each day is a separate offense. ($693.22) The appropriate county district attorney shall represent the State in summary proceedings ($693.23).

The State, any district attorney, or municipal solicitor, may pursue multiple remedies, criminal and civil, in the performance of this act. No actions shall cancel or prohibit other like actions ($693.25).
Appendix E

**Recordkeeping**
At least fifteen (15) days prior to construction, owners shall notify the Department, in writing, of work commencement, including the names of those responsible for construction supervision. Thereafter, detailed reports on structure status must be submitted monthly to the Department (Rule 105.101).

**Oversight**
Section 24 of the DSE Act states that any person who shall be aggrieved by any action of the Department under this act shall have the right within 30 days of receipt of notice of such action to appeal to the Environmental Hearing Board. Supersedeas may be granted upon showing of irreparable harm to petitioner or other interested parties, likelihood of petitioner’s success on the merits, and such a grant will not result in reparable harm to the State. Permit revocation or suspension is subject to appeal and hearing before the Environmental Hearing Board. In civil or administrative action taken by the Department, the person against whom the action has been taken has the burden of proof to demonstrate compliance with these laws (Rules 105.26 and 105.29a).

**Miscellaneous**
There is a provision regulating projects affecting navigable waters of the Delaware Basin. Permits are required for projects affecting submerged lands of the State; subject to grant of an easement, right-of-way, license, or lease to occupy such submerged lands (§693.15). Dams may not be constructed on frozen grounds (Rule 105.103).

  a. **Complaints to Unsafe Conditions**
  - Complaints are mentioned in passing. However, unsafe dams are addressed directly. Owners of dams classified as “Unsafe Dams” must, within time limits of the Department, submit a plan for removal or modification, and undertake and complete such actions. “Unsafe Dams” are those dams with deficiencies of such severity that no action could result in failure, those classified as unsafe by the National Dam Inspection Program, or those classified as unsafe by the Department. Compliance shall be within the shortest time technically feasible and economically achievable. In determining appropriate action for unsafe dams, the Department shall consider the adverse impact on public health and safety from dam or reservoir drainage or removal, and public input from affected communities (via hearings held at Department discretion). The Department may take actions necessary, without public hearing, to revoke or suspend dam permit status, correct suspect deficiencies, or any other actions authorized by law (Rule 105.136).

  b. **Environmental Impact**
  - Environmental protection is emphasized throughout the PA dam and encroachments law. Rule 105.15 provides that persons may not construct, operate, maintain, modify, enlarge, or abandon most regulated dams, encroachments, or reservoirs without first completing and submitting to the Department an environmental assessment. If the Department determines that there may be an impact on natural, scenic, historic or aesthetic environmental values, the Department will consult the applicant to discuss possible mitigation measures. If it is determined that the adverse environmental impact is outweighed by the public benefits of the project (e.g. correction or prevention of pollution, protection of public health or safety, reduction of flood damages, development of energy sources, creation or preservation of significant employment, or provision of public utility services), such social and economic factors shall take priority (Rule 105.16). Permits will not be issued unless applicants show that prospective projects may not have an adverse impact on designated protected habitats, sanctuaries, wetlands, wilderness, or
other ecologies. Permits affecting such protected areas may also be issued upon affirmative demonstration by the applicant that there are no practicable project alternatives, the project will not cause pollution of ground or surface water, and wetlands are replaced (Rules 105.16 & 105.18). Wetlands are defined under Rule 105.17. Preservation of aquatic life and fish shall be maintained and protected in accordance with Fish Commission requests (Rule 105.121-.1123).

c. **Severability**
- The laws and rules do not specifically address severability.

d. **Supplemental Reference Materials**
   - *DEP Permit Guide to Dam Permits* - 1998
   - *Fact Sheets, various subjects* - 1997
RHODE ISLAND

Summary
[Pros] The Department of Environmental Management is in the process of promulgating Dam Safety Regulations (10/2006). The statute states that the general assembly shall appropriate funds necessary to carry out the responsibilities under these sections. The State has statutory authorization to enter upon private or public property in order to carry out their duties under these provisions. The recordkeeping provisions are standard; requiring dam owners to be able to furnish to the department, upon request, pertinent information regarding dam safety.
[Cons] Dam, dam height, and hazard classifications definitions are not found in the laws. The laws do not state clearly that the department has the power to adopt rules, issue permits, or take over the dam in emergency situations. Dam inspection responsibilities lie primarily with the State. The “definitions” section is inadequate. There are no fees assessed for dam safety program operation. The permit/approval provisions are vague.

Citation and Title
[Rules/Regulations] Regulations have not been promulgated since the laws do not give the Department such authority.
[Administrative Agency] The Department of Environmental Management (“department”)

Jurisdiction/Powers of Department
The department is empowered to make inspections (G.L.R.I. § 46-19-1), review and approve plans for construction of dams (G.L.R.I. § 46-19-3), and invoke judicial action for non-compliance (G.L.R.I. § 46-19-5). The director may employ a consulting engineer in any specific case in which the exigencies of the case may require it. G.L.R.I. § 46-19-7.

Liability and Immunity
A dam owner has the responsibility for the safe operation of his or her dam, and is liable for the consequences of accidents or failures of the dam. This responsibility includes the proper maintenance, repair, and rehabilitation.

Definitions/Dam Classifications
a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined.
f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: Not defined.

High hazard – means a dam where failure or mis-operation will result in a probable loss of more than a few human lives or excessive economic loss.

Significant hazard – means a dam where failure or mis-operation will result in a probable loss of a few human lives or appreciable economic loss.

Low hazard – means a dam where failure or mis-operation results in no probable loss of human life and minimal economic loss.
Program Funding
The general assembly shall annually appropriate such sum as it may deem necessary, to pay all necessary expenses. The compensation of the consulting engineer employed by the director, shall be allowed by the director, and shall be paid upon the order of the State Controller out of any money in the treasury appropriated therefore. G.L.R.I. § 46-19-7.

Fees and Costs
The laws do not contain any mention of filing fees. Remedial work is paid for by the owner. G.L.R.I. § 46-19-4.

Permit/Approval Process
G.L.R.I § 46-19-3 requires plans and specifications to be filed and approved by the department before construction or alteration of any dam. The laws do not contain any mention of construction schedules, spillway design criteria, or requirements for the plans and specifications to be drawn by a licensed professional engineer.

Inspection Process
The director shall thoroughly inspect every dam in the State as often as may be necessary to keep himself informed of the conditions thereof. G.L.R.I. § 46-19-1. The laws make no mention of the owners’ inspection or the frequency thereof. The director, on application made to him or her in writing by any person owning or representing property liable to injury or destruction by the breaking of any dam, or on an application made by any mayor or city council of any city, or by the town council of any town, on account of danger of loss of life or of injury to any highway or bridge therein, from the breaking of any dam is unsafe, shall forthwith view and thoroughly examine the dam, or cause the dam to be viewed and examined. If the dam is not sufficiently strong to resist the pressure of water upon it, or if from any other cause the director shall determine the dam to be unsafe, or if there is reasonable cause to believe that danger to life or property may be apprehended from the unsafe dam, the director shall determine whether the water in the reservoir shall be drawn off in whole or in part, and what alterations, additions and repairs are necessary to be made to the dam to make the dam safe. The director shall then notify the owner or the person having control of the dam to cause the additions, alterations, and repairs in the dam or reservoir to be made within a time to be limited in the notice. G.L.R.I. § 46-19-4.

Right of Entry
G.L.R.I. § 46-19-6 sets forth that the director and the directors duly authorized agents may, in the discharge of his or her or their duties, enter upon and pass over private property without rendering him or herself or themselves liable in an action for trespass.

Operation and Maintenance
There is nothing in the statute which requires a person to keep a dam in operation against his will. Powers v. Lawson, 86 R.I. 441, 136 A.2d 613 (1957).

Emergencies/Emergency Action Plans
The dam safety laws do not specifically address emergency procedures or emergency action plans.

Owner Non-Compliance/Violations/Penalties
If the owner or person having control of the dam, who shall be required to draw off the water, or a portion of the water, or make alterations or additions thereto, in the manner prescribed in
G.L.R.I. § 46-19-4 does not comply with the requirement with reasonable expedition, the director shall make out a complaint setting forth the condition of the dam and the steps he or she has taken to initiate alterations, and that the safety of life and property is endangered by the owners noncompliance, and deliver the complaint to the attorney general or to an assistant attorney general, who shall present the complaint to the supreme court or the superior court, with a petition in the nature of an information ex officio, praying that the person owning or controlling the dam be required to comply with the requirement set forth by the director. G.L.R.I. § 46-19-5. The person owning or controlling the dam will then be ordered to appear, to show cause, why the relief prayed for shall not be granted. The court shall summarily proceed to hear the cause, and upon hearing the parties, or by proceeding ex parte, the court may pass such order and decree in the premises as will effectually secure the persons interested from danger or loss from the breaking of the dam complained of; and the court may enforce the orders and decrees by injunction, process for contempt, by sequestration, or by such other process as may be applicable in those cases. G.L.R.I. § 46-19-5.

Recordkeeping
The director shall keep a record of the result of inspections with whatever knowledge the director shall obtain in reference to each dam or reservoir, and shall make an annual report of his or her doings in his or her office in the month of January to the Governor. Every person owning, maintaining, or having control of any dam or reservoir shall, upon written request therefore, furnish to the director of environmental management a full, true, and particular description of the dam or reservoir as may be practicable; and shall, as soon as may be after the request, cause to be made all the necessary surveys, plans, and drawings thereof as may be required by the director. G.L.R.I. § 46-19-2.

Oversight
Individuals contesting the orders of the department will have their cases heard in the supreme or superior court. G.L.R.I. § 46-19-5.

Miscellaneous
a. Complaints to Unsafe Conditions
   - The dam safety laws do not specifically address complaints to unsafe conditions.

b. Environmental Impact
   - The dam safety laws do not specifically address environmental impact.

c. Severability
   - The dam safety laws do not specifically address severability.

d. Supplemental Reference Materials
   - The statute references case law.
SOUTH CAROLINA

Summary
[Pros] The South Carolina Code (S.C. Code) and the Dam and Reservoir Safety Act Regulations are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. The regulations provide a comprehensive “Definitions” section, a sequential summary of the entire dam construction, repair, alteration and removal permitting process, and emphasis on assessing the foreseeable consequences of dam failure and magnitude of flooding resulting from such failure. Under the rules, owners of a dam or reservoir are responsible for maintaining the dam or reservoir in a safe condition throughout the life of the structure at their own expense. The owners of high and significant hazard dams are required to have Emergency Action Plans.

[Cons] The department is primarily responsible for inspecting and classifying all dams. Only if the results of the department’s preliminary inspection form a basis for doing so, will the department order the owner to perform a detailed inspection. Rather than inspections occurring according to a schedule, the department makes inspections within a priority system based on the dam's condition and classification. Under the rules, no permit application fees or annual fees are assessed.

Citation and Title
[Rules/Regulations] Regulations are found in Dams and Reservoirs Safety Act, Regulations Section 72-1 through 72-9 published 1997.
[Administrative Agency] Department of Health and Environmental Control (“department”)

Jurisdiction/Powers of Department
The department has the power to review plans to construct, repair, alter or remove any dam under its jurisdiction. Reg. 72-2. The department has the power to make inspections (Reg. 72-4), issue permits (Reg. 72-2), call for remedial work (Reg. 72-5), cite non-compliance and invoke judicial action. Reg. 72-4. The department also has the power to take over a dam in the event of an emergency (Reg. 72-5), and may make rules and regulations for proper administration of the law. S.C. Code § 49-11-240. The department may employ engineers and technicians it considers necessary. S.C. Code § 49-11-140.

Liability and Immunity
Any person who impounds water or other fluids in South Carolina may be liable for any damage caused by failure of, or improper operation of, a dam or reservoir. Even if a house is built below a dam after the dam is constructed, the owner of the dam is not free from liability. Nothing in the statute and no action or failure to act under the statute imposes liability on the State, the department, districts, or an agency or its officers or employees for the recovery of damages caused by the action or failure to act; or relieves the owner or operator of a dam or reservoir of the duties, obligations, responsibilities, or liabilities arising from or incident to the ownership or operation of a dam or reservoir. S.C. Code § 49-11-250.

Definitions/Dam Classifications
*Dam* means any artificial barrier, together with appurtenant works, including but not limited to dams, levees, dikes or floodwalls for the impoundment or diversion of water or other fluids where failure may cause danger to life or property. Reg. 72-1.
The height of the dam is established with respect to maximum water storage elevation measured from the natural bed of the stream or water course at the downstream toe of the barrier, or if it is not across a stream or water course, the height from the lowest elevation of the outside limit of the barrier, to the maximum water storage elevation. Reg. 72-1.

The following dams are exempt from the provisions in the Act:

- Any dam less than 25 feet in height and less than 50 acre-feet in impounding capacity (unless a life-threatening hazard warrants otherwise).
- Dams owned or operated by the federal government.
- Any dam owned or operated by the Federal Energy Regulatory Department or the South Carolina Public Service Authority.
- Dams under roads maintained by the Department of Highways and Public Transportation or by county or municipal governments.
- Dams which are determined to pose no significant threat to downstream life or property.

Dams are classified by size and hazard potential:

### Size Classification

<table>
<thead>
<tr>
<th>Category</th>
<th>Storage (ac-ft)</th>
<th>Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very small</td>
<td>&lt; 50</td>
<td>&lt; 25</td>
</tr>
<tr>
<td>Small</td>
<td>≥ 50 and &lt; 1000</td>
<td>≥ 25 and &lt; 40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>≥ 1000 and &lt; 50,000</td>
<td>≥ 40 and &lt; 100</td>
</tr>
<tr>
<td>Large</td>
<td>≥ 50,000</td>
<td>≥ 100</td>
</tr>
</tbody>
</table>

### Hazard Classification

<table>
<thead>
<tr>
<th>Class</th>
<th>Hazard Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>I - High</td>
<td>Dams located where failure will likely cause loss of life or serious damage to homes, industrial and commercial facilities, important public utilities, main highways or railroads.</td>
</tr>
<tr>
<td>II - Significant</td>
<td>Dams located where failure will not likely cause loss of life but may damage homes, industrial and commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important public utilities.</td>
</tr>
<tr>
<td>III - Low</td>
<td>Dams located where failure may cause minimal property damage to others.</td>
</tr>
</tbody>
</table>

#### a. Abandonment: Not defined.

#### b. Engineer: A registered professional engineer licensed to practice in the State or an individual employed by the USDA-Natural Resources Conservation Service with the title of “engineer” who is qualified and authorized to sign documents prepared and submitted by USDA-Natural Resources Conservation Service.

#### c. Hazard Potential: The potential for causing property damage or loss of human life in the event of failure or improper operation of a dam or reservoir.

#### d. Operator: Not defined.

#### e. Owner: Those who own, control, operate, maintain, manage, or propose to construct a dam or reservoir. In cases where a dam has been abandoned by its owner (either intentionally or unintentionally), and it is necessary to reestablish ownership, the department shall look first to those entities who hold title to the property on which the dam is constructed and those entities which have acquired some legal responsibility for the dam through covenants or other legal agreements, and secondarily to the other entities who fall under the definition of owner.

#### f. Person: Not defined.
g. **Repairs (Alterations):** Only the alterations or repairs which may affect the safety of a dam or reservoir.

h. **Spillway:** Not defined.

Program Funding
The dam safety laws and rules do not specifically address program funding.

Fees and Costs
The dam safety laws and rules do not mention filing fees and costs. Remedial work is paid for by the owner. Reg. 72-5.

Permit/Approval Process
Any individual who proposes to construct a new dam or repair, alter or remove an existing dam shall apply for and obtain from the department written approval for the proposed work. S.C. Code § 49-11-120; Reg. 72-3. Separate applications for permits are required for each of the aforementioned actions. S.C. Code § 49-11-210. A design, approved by a registered professional engineer, should accompany the application. S.C. Code § 49-11-220. The initial application for any permit shall be signed by the owner and should be submitted to the conservation district office, where, if it is deemed necessary, the district will forward the application to the department. The district office may offer technical assistance to the applicant in certain circumstances.

After the particular agency reviews the application, the applicant may be advised of the dam's classification and of any needed alterations. The final application must be prepared and approved by an engineer. Spillway design criteria are required and are found in the regulations. Reg. 72-3, Table I.

The Regulations set forth the general permit application requirements which include, at a minimum: the name and address of the dam owner; dam location; height and purpose; reservoir surface area, watershed area and characteristics; stream flow; description of existing and probable downstream development; type of permit requested; a brief description of the work to be performed and the proposed time of commencement and completion of work. Reg. 72-3. The information required in a permit application will, however, vary depending on the dam's classification and type of permit requested. Specifically, the Regulations set forth specific application requirements for construction, repair, alteration, and removal permits.

The owner shall notify the department in writing when the work for which the permit was issued is completed. Reg. 72-3(F). The notice shall be filed within ten days of completion. The department shall issue a certificate of completion and operation upon receipt of a notice of completion. The certificate shall contain the normal requirements for maintenance and operation which shall refer to, as a minimum, maintenance as is necessary to prevent the growth of trees and brush on the embankment and spillway system; maintenance as is necessary to remove debris or other deleterious materials from the spillway system; and required inspections.

Inspection Process
[State] Classification inspections are initially required to determine if the dam falls under the provisions of the Dam and Reservoir Safety Act. Subsequent classification inspections may be necessary as development occurs which could effect the hazard potential of a dam, and consequently its classification. The department makes preliminary inspections within a priority system based on the dam's condition and classification. The preliminary inspection includes a visual examination of the dam and its appurtenant works and may include an analysis of the dam’s ability to pass floodwaters or other problems that may be suspect as a result of the visual examination. The results of a preliminary inspection may form the basis for ordering the owner to perform a detailed inspection. Detailed inspections may be performed voluntarily or pursuant to an order issued by the department. A professional engineer licensed in South Carolina must
perform a detailed inspection. Reg. 72-4. In addition, the department may make necessary inspections during construction of new dams and reservoirs, enlargements, removal, and repairs and during work done pursuant to repair orders. S.C. Code § 49-11-230.

[Owner] The results of the preliminary inspection may form the basis for ordering the dam owner to perform a detailed inspection. Detailed inspections may be performed voluntarily or pursuant to an order issued by the department. A professional engineer must perform the detailed inspection. The detailed inspection shall be performed in sufficient detail so that appropriate plans and specifications correcting all deficiencies of the dam can be prepared by the engineer and submitted by the owner to the department. The results shall be in the form of a permit application requesting either a repair, alteration or removal permit.

Right of Entry
An authorized member, agency, or representative of the department may enter State or private lands and natural or artificial waterways in the State to discharge the duties set forth in this article.

Operation and Maintenance
The owner of a dam or reservoir is responsible for maintaining the dam or reservoir in a safe condition throughout the life of the structure. S.C. Code § 49-11-150. The department may issue an order directing the owner of a dam to make at his expense necessary maintenance, alteration, repair, or removal. S.C. Code § 49-11-160.

Emergencies/Emergency Action Plan
The department has the power to issue immediate orders in the event of an emergency. S.C. Code § 49-11-190. Limited powers of the department may be exercised to direct the owner to take whatever immediate measures necessary to reduce the risk of dam failure. Reg. 72-5. Failure of the owner to comply with the emergency order can result in the department causing the remedial work to be carried out with the expenses of the work being later incurred by the owner. S.C. Code § 49-11-190; (72-5). The laws and regulation require Emergency Action Plans for high hazard and significant hazard dams. EAPs must include an emergency alert notification plan on a format sheet supplied by the department and a written listing of the specific actions that shall be taken if there is reason to conclude the dam is near failure or has failed. It is the responsibility of the dam owner to notify any downstream property owners.

Owner Non-Compliance/Violations/Penalties
The department has the authority and responsibility to issue orders to dam owners mandating remedial measures necessary to protect life and property from danger imposed by unsafe dams. The remedial measures ordered by the department shall be made at the dam owner's expense and will normally include a detailed inspection followed by appropriate repairs. Reg. 72-5. After receiving an "Inspection and Repair Order", the owner has 30 days in which to request a hearing on the matter. The process of enforcement of this order is not clearly stated in the regulations. S.C. Code § 49-11-260 provides that violations shall constitute a misdemeanor punishable by fines of not less than $100 or more than $500 per day of violation.

Recordkeeping
The owner of a dam or reservoir shall inform the department in writing within thirty days after title to the dam or reservoir legally has been transferred from his ownership. S.C. Code § 49-11-150.
Oversight
Objectors to actions taken by the department may follow the appeal process outlined in section (72-9). An administrative hearing is available, following a timely request, to determine the propriety of: dam classifications, revocation or denial of a permit, terms of a permit, and issuance of an inspection and repair order.

Miscellaneous
The owner of a high or significant hazard dam shall inform the department in writing within thirty days after title to the dam or reservoir has been transferred. Reg. 72-6.

a. Complaints to Unsafe Conditions
- The existence of a dam which is not maintained in good repair or operating condition or may be unsafe and a danger to life or property may be brought to the attention of the department by complaint, staff, or authorized investigation or by other means. S.C. Code § 49-11-170.

b. Environmental Impact
- The dam safety laws and rules do not specifically address environmental impact.

c. Severability
- The dam safety laws and rules do not specifically address severability.

d. Supplemental Research Material
- The dam safety laws and rules do not specifically address supplemental research materials.
SOUTH DAKOTA

Summary
[Pros] The intent of the rules is to provide minimum standards for design, construction, alteration, maintenance, and repair of dams and to prevent loss of life. The rules provide minimum spillway design requirements in general and for category 2 and 3 dams. The rules also provide design requirements for category 1, tailings dams, and for dams constructed without spillways. In addition, the rules set forth what the contents of “plans and specifications” must include.
[Cons] The South Dakota Codified Laws and the Administrative Rules of South Dakota are not organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. The rules are not meant to apply to ordinary maintenance and repair of dams if the work is performed in accordance with an original design prepared by an engineer and no change in safety hazard or purpose is involved. The rules do not discuss the permit application process. The rules contain a limited “Definitions” section. Under the rules, the Chief Engineer is responsible for inspecting all category 1 dams at least once every 5 years. The rules do not establish whether the Chief Engineer is responsible for inspecting category 2 or 3 dams. Moreover, under the rules, the owner is required to employ a registered professional engineer to make periodic inspections, detailed investigations, and analysis of existing dams. No requirements regarding the scheduling or frequency of such inspections, however, are found in the statutes or rules. The rules do not discuss how the Dam Safety Program is funded.

Citation and Title
[Rules/Regulations] Dam safety regulations are in Administrative Rules of South Dakota (A.R.S.D.) Chapter 74:02:08, which became effective in 1986 and were last amended in 1992.
[Administrative Agency] Water Rights Program, Chief Engineer

Jurisdiction/Powers of Department
The Chief Engineer of the SD Water Rights Program has the statutory authority to review and approve or disapprove plans to construct, alter, maintain or repair dams. A.R.S.D. 74:02:08:03 and :09. The Chief Engineer, according to the provisions of S.D.C.L. § 46-7-5, may also inspect dams, and if a dam is found to be in an unsafe condition, issue orders for remedial work to be done at the owner's expense. S.D.C.L. § 46-7-5.1 grants to the Chief Engineer the authority to enter upon the property of a dam owner who has failed or refused to comply with an order to repair, for the purpose of making the necessary changes. Powers in an emergency situation are addressed in S.D.C.L. § 46-7-5.2
A.R.S.L. 78:02:08:09 states that the Chief Engineer must review and approve plans and specifications prior to the new construction, reconstruction, alteration, repair or breaching of a dam. In addition, the Water Management Board has the power to issue permits for construction and impoundment, and a permit must be obtained prior to the construction of a new dam. The Water Management Board is also responsible for the promulgation of rules to establish minimum safety standards for the design, construction, alteration, maintenance and repair of works. S.D.C.L. § 46-7-3.

Liability and Immunity
S.D.C.L. § 46-7-5 provides that "The Chief Engineer, the State or its employees shall not incur any liability, either sovereign or personal, as a result of the duties imposed by this section or other provisions related to the inspection and repair, maintenance or alteration of works or the
notification to owners of unsafe conditions". Under S.D.C.L. § 46-7-5.7, the Chief Engineer and all officers, employees and agents of the State of South Dakota are under no obligation to secure the safety of, or take any further action with regard to, a privately owned high-hazard dam if the owner of the dam refuses to correct an unsafe condition identified by order of the Chief Engineer pursuant to S.D.C.L. § 46-7-5, and executes an affidavit, which is accepted for filing by the water management board.

**Definitions/Dam Classifications**
The term *dam* is defined in A.R.S.D. 74:02:08:01 (7) as "an artificial barrier, including appurtenant works, which impounds or diverts water and which is 25 feet or more in height from the natural bed of the stream or watercourse measured at the downstream toe of the barrier or from the lowest elevation of the outside limit of the barrier, if it is not across a stream channel or watercourse, to the maximum water storage elevation or has an impounding capacity at maximum water storage elevation of 50 acre-feet or more. A barrier is not considered a dam if the height does not exceed 6 feet regardless of storage capacity, or if the storage capacity at maximum storage elevation does not exceed 15 acre-feet regardless of height. The term *height* is defined in the same section as "the difference in the elevation of either the natural bed of the stream or watercourse or the lowest point on the toe of the dam, whichever is lower, and the crest elevation of the dam.

Dams are classified according to hazard potential and size:

**Hazard Potential**

<table>
<thead>
<tr>
<th>Category</th>
<th>Loss of Life</th>
<th>Economic Loss Potential</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>No loss of life expected.</td>
<td>Limited damage to agricultural lands or county and township roads or minimum economic loss.</td>
</tr>
<tr>
<td>2</td>
<td>No loss of life expected.</td>
<td>Damage to buildings, highways, railroads, bridges, or public utilities; loss of water supply reservoir for a water distribution system; other extensive economic loss; or the reservoir is the only source of water for a water distribution system.</td>
</tr>
<tr>
<td>1</td>
<td>Failure may cause loss of life.</td>
<td>Extensive.</td>
</tr>
</tbody>
</table>

**Size Classification**

<table>
<thead>
<tr>
<th>Size</th>
<th>Storage Capacity (acre-feet)</th>
<th>Height (feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>50 - 1000</td>
<td>25 - 40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1001 - 50,000</td>
<td>41 - 100</td>
</tr>
<tr>
<td>Large</td>
<td>greater than 50,000</td>
<td>greater than 100</td>
</tr>
</tbody>
</table>

a. **Abandonment:** Not defined.
b. **Engineer:** Not defined.
c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** Not defined.
f. **Person:** Not defined.
g. **Repairs:** Not defined.
h. **Spillway:** An open or closed channel, conduit, or drop structure used to convey water from a reservoir.

**Program Funding**
The dam safety statute and rules do not address program funding.

**Fees and Costs**
Inspection fees are not assessed by the State.

**Permit/Approval Process**
A.R.S.D. 74:02:08:09 requires that minimum plans and specifications for the design, construction, or alteration of dams be submitted to the Chief Engineer for review, and sets forth the types of information which must be included. Plans and specifications must be prepared, and construction or alteration inspections must be performed by a registered professional engineer in accordance with the provisions of A.R.S.D. 74:02:08:04. Plans and specifications must be approved, and a water permit to construct must be acquired from the Water Management Board before new construction can begin. Minimum spillway design flood requirements are listed for each hazard category and size of dam in the rules, section 74:02:08:07. Exceptions to these standards, standards for tailings dams, and additional design requirements are addressed in A.R.S.D. 74:02:08:07.01 through :07.04. Water permit application fees are addressed in S.D.C.L. § 46-2-13.

**Inspection Process**
[State] A.R.S.D. 74:02:08:11 mandates the Chief Engineer to inspect all category 1 dams at least once every 5 years or as often as necessary in order to ensure the continued safety of a dam. If the works are found to be unsafe, the Chief Engineer is authorized by law (S.D.C.L. § 46-7-5) to issue an order for necessary changes within a specified time, and if the owner fails to make the repairs, the Chief Engineer may enter the property and put the works in a safe condition. Costs incurred are borne by the owner. The Chief Engineer is also authorized to immediately breach or repair any works, if, in his judgment, it is necessary to protect human life from imminent danger. The cost of the work in such cases shall be borne by the owner of the works and may be recorded as a lien against any property of the owner until paid. S.D.C.L. § 46-7-5.2.

Upon petition by the owner, the Chief Engineer may investigate and conduct the necessary analysis to determine the potential for damage to downstream residents or property if a dam were to fail due to inadequate spillway capacity. The engineer may recommend that a variance to board rules relating to minimum spillway design requirements for dams be granted or denied. S.D.C.L. § 46-7-5.3.

[Owner] The rules (section 74:02:08:04) require that periodic inspections, detailed investigations, and analysis of existing dams be performed by registered professional engineer. No requirements regarding the scheduling or frequency of such inspections are found in the statutes or rules.

**Right of Entry**
The statutes also grant to the Chief Engineer the authority to enter upon the property of a dam owner who has failed or refused to comply with an order to repair, for the purpose of making the necessary changes. S.D.C.L. § 46-7-5.1.

**Operation and Maintenance**
The owner of any works for the storage, diversion or carriage of water or for the application of water to beneficial use, including wells, shall keep the works in good repair at all times to ensure safety of the works and to prevent waste of water. S.D.C.L. § 46-7-3.

**Emergencies/Emergency Action Plan**
Emergency procedures are addressed in S.D.C.L. § 46-7-5.2. The Chief Engineer may immediately breach or repair any works if, in his judgment, it is necessary to protect human life from imminent danger. Emergency Preparedness Plans are required to be prepared and submitted
by the owners of all existing category 1 dams, and as part of the plans and specifications for proposed category 1 dams. A.R.S.D. 74:02:08:10.

**Owner Non-Compliance/Violations/Penalties**
S.D.C.L. §§ 46-7-5 and 5.1 state that if upon inspection the Chief Engineer finds that a dam is in an unsafe condition, he may issue an order for remedial work or repairs within a specified time limit. If the owner fails or refuses to make the required repairs, the Chief Engineer is authorized to enter the property and make them. Costs of such repairs are the responsibility of the owner, and may be recorded as a lien against the owner's property until paid. It is also noted in the statutes that the authorization of these activities does not limit any other remedy against the owner of the works, although additional penalties may include fines, and are referenced in S.D.C.L. § 46-1-11.

**Recordkeeping**
The dam safety laws and rules do not specifically address recordkeeping.

**Oversight**
A hearing process by which owners may contest an order of the Chief Engineer is described in S.D.C.L. § 46-7-5. Owners may file a written protest, which suspends the operation of the order until a hearing has been scheduled and action taken by the Water Management Board. In addition, S.D.C.L. § 46-7-5.3, allows owners to petition the Chief Engineer for a variance to board rules relating to minimum spillway design requirements. The Chief Engineer then investigates the works and conducts the necessary analysis to determine the potential for damage to downstream residents or property in the case of failure due to inadequate spillway capacity. After the investigation and analysis, the Chief Engineer may recommend to the Water Management Board that the variance request be granted or denied.

S.D.C.L. §§ 46-7-5.4 through 5.11 provide that owners of privately owned high hazard dams who refuse to correct an unsafe condition identified by order of the Chief Engineer may execute an affidavit assuming liability for the dam and holding the state harmless from all such liability and damages to the dam's failure. The affidavit must certify, among other things, that the owner's family is the only family inhabiting the floodplain.

**Miscellaneous**
1. S.D.C.L. § 46-7-1 provides that the owners of a storage or diversion works may be required to make excess capacity of the works (over and above that needed by the owner for lawful application of water to beneficial use) available at reasonable rates, to any person entitled to use water for beneficial purposes. The Water Management Board is responsible for determining the amount of excess capacity, establishing reasonable rates, and setting the amount of compensation to be paid the owner for damage to the works.
2. The Water Management Board is authorized under S.D.C.L. § 46-7-2 to require any appropriator to construct head gates and measuring devices before allowing the diversion of water.
3. S.D.C.L. § 46-7-14 of the statutes makes it unlawful in the State for any person to interfere with, damage or destroy any dam or embankment, or to interfere with or damage any pier, boom, gate or piles used in securing a dam.
4. If any individual other than the owner of a high-hazard dam establishes a habitation within the floodplain, the owner shall report the name, address and location of the individual to the Chief Engineer within ten days. S.D.C.L. § 46-7-5.6.
   - **Complaints to Unsafe Conditions**
     - The dam safety laws and rules do not specifically mention complaints to unsafe conditions.
b. **Environmental Impact**  
- The dam safety laws and rules do not specifically mention environmental impact.

c. **Severability**  
- The dam safety laws and rules do not specifically address severability.

d. **Supplemental Reference Material**  
- The dam safety laws and rules do not specifically mention supplemental research material.
TENNESSEE

Summary
[Pros] The Tennessee Code (T.C.) and the Tennessee Department of Environment and Conservation Rules and Regulations (Reg.), set forth standards for existing dams and new construction dams. Under the standards for existing dams, the regulations discuss slope protection, emergency spillway and stability. The design standards for new dams must conform to accepted practices and procedures of the engineering profession. Under design standards, the regulations set forth criteria for design of dams, principal spillways, drawdown facilities, emergency spillways and earth embankments. The Regulations establish a comprehensive fee structure wherein fees are assessed for project review for all new dam and reservoir construction and for safety inspections by the division. It is unclear whether a dam safety “fund” exists, but all fees collected are placed in a special account and earmarked, allocated, and appropriated to the division of water management of the department of environmental and conservation for the purposes of complying with this chapter.
[Cons] The rules do not provide adequate inspection laws or regulations for the department or the owner of a dam. An inspection frequency table does not exist.

Citation and Title
[Rules/Regulations] Regulations are found in the Rules of the Tennessee Department of Environment and Conservation, Division of Water Supply, Chapter 1200-5-7 (“Reg.”).
[Administrative Agency] Division of Water Supply of the Department of Environment and Conservation

Jurisdiction/Powers of Department
The law gives enforcement authority to the commissioner of Environment and Conservation through the Division of Water Supply. Under T.C. § 69-11-104, the commissioner may exercise the following powers: administer the provisions of this chapter and the provisions of rules and regulations adopted by the commissioner pursuant to this chapter; conduct or obtain inspections, investigations, research, training programs and demonstrations and collect and disseminate information relating to the safe construction, operation, or maintenance of dams and reservoirs; adopt general rules and regulations that the commissioner deems necessary to accomplish the purpose of this chapter; assess civil penalties, issue orders requiring the adoption by an owner of remedial measures; examine and approve or disapprove applications for certificates of approval for construction; make investigations or inspections; and suspend or revoke any certificate of approval. T.C. § 69-11-104. When the commissioner determines that a permit is not being met or the conditions at the site are unsafe, he may order the owner to remedy the situation at the owner's expense. In emergency situations, the commissioner may take over the dam to render it safe. The owner is also responsible for these costs. The commissioner may take legal action to recover the costs from the owner. T.C. § 69-11-117. The commissioner may enter into contracts or agreements with other states, local or federal agencies, or other persons for work necessary to implement necessary emergency actions.
Liability and Immunity
Nothing in the laws should be construed to relieve the owner or owners of a dam or reservoir of the legal duties, obligations, or liabilities incident to the ownership or operation of the dam or reservoir. Moreover, nothing in the laws shall be construed to impose legal duties, obligations or liabilities incident to the ownership or operation of a dam upon the State, a county or city that maintains a roadway upon a dam if the State, such county or city did not construct the dam. T.C. § 46-11-124.

Definitions/Dam Classifications
The law and the regulations define a dam as any artificial barrier, together with appurtenant works, which does or may impound or divert water, and which either (1) is or will be twenty feet or more in height from the natural bed of the stream or watercourse at the downstream toe of the barrier, as determined by the Commissioner, or (2) has or will have an impounding capacity at maximum water storage elevation of thirty acre-feet or more. Provided, however, that any such barrier which is or will be less than six feet in height, regardless of storage capacity, or which has or will have a maximum storage capacity not in excess of fifteen acre-feet, regardless of height, shall not be considered a dam, nor shall any barrier, regardless of size, be considered a dam, if, in the judgment of the Commissioner, such barrier creates an impoundment used only as a farm pond" T.C. § 69-12-102-(3) and Rule 1200-5-7-.02 (10). Diversion weirs, roadbeds, water tanks, and wastewater impoundment barriers as defined are not considered dams.

According to the regulations, dams are classified by size and hazard potential:

[Size Classifications]

<table>
<thead>
<tr>
<th>Category</th>
<th>Storage (acre-feet)</th>
<th>Height (ft)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small</td>
<td>30 - 999</td>
<td>20 - 40</td>
</tr>
<tr>
<td>Intermediate</td>
<td>1000 – 50,000</td>
<td>41 - 100</td>
</tr>
<tr>
<td>Large</td>
<td>50,000 +</td>
<td>100 +</td>
</tr>
</tbody>
</table>

[Hazard Potential Classifications]

Category 1 dams are located where failure would probably result in any of the following: loss of human life; excessive economic loss due to damage of downstream properties; excessive economic loss, public hazard, or public inconvenience due to loss of impoundment and/or damage to roads or any public or private utilities.

Category 2 dams are located where failure may damage downstream private or public property, but such damage would be relatively minor and within the general financial capabilities of the dam owner. Public hazard or inconvenience due to loss of roads or any public or private utilities would be minor and of short duration. Chances of loss of life would be possible but remote. Category 3 dams are located where failure may damage uninhabitable structures or land but such damage would probably be confined to the dam owner's property. No loss of human life would be expected. Reg. 1200-5-7-.05.

The regulations state that dams will be re-evaluated for hazard potential every 5 years (1200-5-7-.05).

a. Abandonment: Not defined.
b. Engineer: Professional engineer registered by the State of Tennessee.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Any person who owns an interest in, controls, or operates a dam.
f. Person: Any individual, firm, association, organization, partnership, business trust corporation, company, county, municipal or quasi-municipal corporation, public utility, utility or other district, the state of Tennessee and its departments, divisions, institutions, and agencies, and the duly authorized officers, agents and representatives
thereof, or any combination of any of the above. “Person” does not include the U.S. Government.

g. **Repairs (Alteration):** Any repair, change to the structure, removal or change in use of a dam that may affect the safety of that dam.

h. **Spillway:** The feature of a storage or detention dam which is designed to release surplus water, and at diversion dams is a means to bypass flows exceeding those which are turned into the diversion system.

**Program Funding**

All fees collected are placed in a special account and earmarked, allocated, and appropriated to the division of water management of the department of environmental and conservation for the purposes of complying with this chapter.

**Fees and Costs**

The law establishes two fee structures based on the construction of new dams and the safety inspection of existing dams. T.C. § 69-11-116. A project review fee will be charged for all new dam and reservoir construction. The fee is to accompany the application for a construction certificate. New dams will not be charged for the initial operating certificate. The fee will be based upon the size categories shown below – at no point shall the total project review fee exceed 1% of the total estimated cost of the dam.

<table>
<thead>
<tr>
<th>Height of Dam</th>
<th>Charge for Project Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>6 – 40 feet</td>
<td>$1000</td>
</tr>
<tr>
<td>41 – 60 feet</td>
<td>$1500</td>
</tr>
<tr>
<td>Greater than 60 feet</td>
<td>$2000</td>
</tr>
</tbody>
</table>

Fees will also be charged for safety inspections by the division. The fee is to accompany the application for an operating certificate. The fee will be $300 per inspection. Reg. 1200-5-7-.09.

**Permit/Approval Process**

The law says that it is unlawful to construct, enlarge, repair, alter, remove, maintain, or operate a dam without first obtaining a certificate of approval and safety. T.C. § 69-11-105. In order to receive a certificate, an applicant must follow specific instructions that are described in the law. The regulations describe the types of certification and the process. There are three types of certification: construction, operation, and alteration. All three have different requirements described in the regulations. Reg. 1200-5-7-.04. Dam design standards are described in the regulations and include information on existing dams on stability, slope protection, and emergency spillways; and, for new dams on overall design, principal spillways, drawdown facilities, emergency spillways, and earth embankments. It also lists engineering requirements. Reg. 1200-5-7-.06-.08.

Plans and specifications submitted to the commissioner for construction, enlargement, alteration, repair or removal of dams and reservoirs shall be the responsibility of and signed by a professional engineer. T.C. § 69-12-106. Nothing in the law or regulations discusses bond requirements by the owner to ensure financial responsibility of work. The law describes specific conditions for approval of a certificate, points the commissioner should follow. Before the certificate is approved, the commissioner shall conduct an inspection of the site and the certificate will be issued or not within sixty days of this inspection. T.C. § 69-12-110. Certificates of Approval shall be for a definite period of time, not to exceed 5 years. At the expiration of the definite period, the applicant must reapply. T.C. § 69-11-113.
Inspection Process
[State]
Under T.C. § 69-11-115, the commissioner shall conduct a program of regular inspections of dams, reservoirs, and downstream floodplains within the State. The frequency of such inspections shall be as determined by the commissioner, who may establish different inspection intervals for dams based on their hazard categories. To date, an inspection frequency table is not in the laws or regulations.

[Owner]
Owner inspections are not specified in the rules and laws. Also, it is not mentioned if owner inspections are required to be conducted by an engineer.

Right of Entry
Right of entry is addressed in other sections.

Operation and Maintenance
No person shall operate a dam without an Operating Certificate. An application for an Operating Certificate for a new dam already having a Construction Certificate must be made on forms available from the commissioner within 30 days of completion of the dam. The application shall be accompanied by a history of the construction of the dam as maintained by the responsible engineer and a statement by the engineer that the construction was performed in accordance with the approved plans and specifications. Rule 1200-5-7-.04. The history of the construction shall include a record of all geological and foundation data; date, location, and results of materials used; narrative of problems encountered during construction; photographs of completed foundations; a record of permanent location points, benchmarks, and any instruments embedded in the structure; and plans which show actual construction.

Emergencies/Emergency Action Plans
The owner is responsible for taking emergency action when necessary but, when the owner fails to take satisfactory action where, in the judgment of the commissioner, the danger to life or property will not permit delay, the commissioner shall request that a state of emergency be declared by the governor, and upon such declaration, shall take such action as he deems necessary to render the dam or reservoir safe. T.C. § 69-11-117. When the State takes emergency action, the owner of the dam shall be liable for the costs of taking such action and a lien for the costs of taking such action shall be automatically created on all property owned by any such owner at or proximate to such dam or reservoir. T.C. § 69-12-117. The regulations do not require the owner to submit emergency action plans to the commissioner.

Owner Non-Compliance/Violations/Penalties
If the commissioner determines that any person, to whom a certificate of approval has been issued, failed to comply with the conditions in the certificate, the commissioner shall order the owner of the dam or reservoir to take such action as is necessary to render the dam or reservoir safe. T.C. § 69-11-117. The commissioner may bring suit for injunctive enforcement of any order made by him when such order has become final and such person has failed to comply with the order. T.C. § 69-11-120. Any person who violates or fails to comply with any provision of the laws or rules shall be subject to a civil penalty of not less than $50 or more than $5,000 per day of violation. Each day the violation occurs constitutes a separate violation. T.C. § 69-12-121. The law describes what actions constitute violations and the penalty assessment process in detail (i.e. what action constitutes a violation) T.C. § 69-12-117. Where the owner fails to take satisfactory action toward compliance with the commissioner’s order, or where in the judgment of the commissioner the danger to life or property will not permit delay, the commissioner shall
request that a state of emergency be declared, and shall take such action to render the dam or reservoir safe.

**Recordkeeping**
Recordkeeping is addressed in other sections.

**Oversight**
The commissioner shall call a public hearing if grievances concerning a violation or certificate disapproval or revocation should arise. The law describes the hearing procedure in detail. T.C. § 69-11-118. Appeals from judgments or decrees of the chancery court [based on indictments for non-compliance issued by the commissioner] in proceedings under the provisions of the law shall lie to the Court of Appeals despite the fact that controverted questions of fact may be involved T.C. § 69-11-120.

**Miscellaneous**
With regard to the permit process, the law provides that State certification requirements are waived for those projects approved by the federal government. It goes on to say that Army Corps of Engineers inspection reports are valid inspections and can be used for State records, provided they are not more than one year old. T.C. § 69-11-106. The law describes the transfer of ownership process and says that multiple dam owners are not required to obtain individual certificates. T.C. § 69-12-107. In addition, whenever legal title to a dam, for which a certificate of approval has been issued, is modified to create real property interests, including leasehold interests, in persons not listed on the application for the certificate, the owner of the dam shall make application for a new certificate within ninety days of the date the interests are created. T.C. § 69-11-108.

a. **Complaints to Unsafe Conditions**
- The dam safety laws and rules do not specifically address complaints to unsafe conditions.

b. **Environmental Impact**
- The dam safety laws and rules do not specifically address environmental impact.

c. **Severability**
- The dam safety laws and rules do not specifically address severability.

d. **Supplemental Reference Materials**
- The dam safety laws and rules do not specifically address supplemental reference materials.
TEXAS

Summary
[Pros] The Texas Water Code addresses many issues outside of dam safety, such as: rights to use and store State waters, which are held in the public trust; fixing rates for furnishing raw water for any purpose in the Code (no such fixation may affect the jurisdiction of the Public Utility Commission); creating water districts; determining the competence of any water district officers and directors; and issuing bonds for water district improvements. The Texas Water Code is very focused on the attainment of rights to utilize or store State waters, and also provides for the use of eminent domain to seize control of sought properties and water rights. While the Texas Water Code establishes many water-related policies, this summary attempts to stay within the narrow confines of the State Administrative Code regulating “Dams and Reservoirs”, which is under “Environmental Quality”.

Upon emergency and without notice, the statute gives the administering agency, the Commission (Texas Natural Resource Conservation Commission), authority to issue an emergency order mandating a dam owner to take the necessary actions to protect human life and health. The Commission is directed to actively and continually evaluate any outstanding permits and certified filings, and to carry out measures to cancel or certify such permits as needed. Projects proposed by a federal agency must go through the Governor and Commission – who shall hold public hearing for any persons affected by such proposed project – before approval is granted. The State has some authority and input over proposed federal projects affecting State waterways. The Commission is exempt from any recording, filing, or use fees under the Water Code. The Commission shall deposit whatever costs are collected under the Code in the State Treasury, which shall be used to administer and perform the duties under Section 11 (Water Rights) of the Texas Water Code. Dam owners are required to furnish the Commission with any requested information regarding dam investigation, at owner’s expense. Monthly progress reports must be submitted to the Director during construction, with daily inspections done by a registered professional engineer employed by the owner during construction. Dams must be monitored, maintained throughout their lives, and must be removed or breached upon abandonment. The Director may grant exceptions to certain provisions in the Code, if determined that the conditions render such requirements unnecessary. The dam re-evaluation criteria are stringent; an active and progressive deteriorating condition is sufficient to find a dam is structurally inadequate. Interim alternatives to dam upgrading or removal are available, such as temporary repairs, insurance coverage, and downstream warning plans. Variances are also available to owners, upon Commission discretion. The contents of submitted construction plans are comprehensive. The use of instrumentation and technology to conduct ongoing dam monitoring is stated in both Codes. Upon completion of dam construction, the owner and employed engineer shall submit to the Director for permanent filing a complete set of drawings showing reference marks for future use.

[Cons] The dam hazard classification does not take into account the condition of the dam itself, only impact on surrounding areas upon failure. Dams must be re-evaluated from “time to time” according to downstream development. “Ordinary maintenance or repair”, which do not require Commission approval, are not defined. The executive director may make, but is not required by law to make, periodic inspections for the purpose of ascertaining compliance with approved plans and specifications. No fees for inspection are charged by the state. There are no annual fees for dam operation, only for water storage and use. The engineering requirements are soft.
Citation and Title
[Administrative Agency] Texas Natural Resource Conservation Commission, through the Executive Director.

Jurisdiction/Powers of Department
The entity with responsibility is the Natural Resource Conservation (the "Commission") per 12.052 of the Texas Water Code. Also under the Texas Water Code, the Commission has the statutory authority to condemn unsafe works, the executive director has the power to inspect construction projects, and Commission employees have the power to enter a person's land for the purpose of making an investigation (See TWC Sections 12.015, 12.016, and 12.017). The Commission is empowered to make rules by the Texas Water Code Section 12.052. Regulations section 299.22 grants the Commission the power to review and approve plans for construction, enlargement, alteration, repair or removal of dams. Approval takes the form of a letter, not a permit. The executive director may make inspection during construction (section 299.26) and site non-compliance at any time (section 299.28). The executive director may call for remedial work if necessary and invoke judicial action to enforce compliance (section 299.28). The executive director may issue emergency orders if necessary (section 299.61) and call for the removal of the dam (section 299.51).

Upon receipt of an engineering report for a federal project to impound State waters, the Governor shall forward the report to the Commission, who shall hold a public hearing, then disapprove or approve the proposed project. The Commission shall determine feasibility based on the project’s effect on water users, public interest served, development of dam sites, integration of the federal project with other water activities, protection of the State’s interest, and engineering practicality (TWC 12.051).

During construction of a project affecting fresh water supply districts, the Commission may ensure that the project is being constructed according to Commission approval and may notify the attorney general to take appropriate action if deviations from Commission approval are found (TWC 12.082). The Director may issue a waiver of some rules (relating to the registered engineer, plan approval, content of plans and specifications), if the dam physical conditions warrant (299.5). The Director may also allow for variances, based on evaluations of potential dam failure, proposals to reduce hazards, and economic or physical limitations to upgrading (TAC 299.18).

(TWC 11.033) The right to take water necessary for domestic and municipal supply purposes is primary and fundamental, and the right to recover from other uses water which is essential to domestic and municipal supply purposes is paramount and unquestioned in the policy of the state. All political subdivisions of the state and constitutional governmental agencies exercising delegated legislative powers have the power of eminent domain to be exercised as provided by law for domestic, municipal, and manufacturing uses and for other purposes authorized by this code, including the irrigation of land for all requirements of agricultural employment.

Liability and Immunity
Nothing in the rules or orders made by the Commission shall be construed to relieve an owner or operator of a dam or reservoir of the legal duties, obligations or liabilities incident to ownership or operation (TAC 299.3, TWC 12.052).
Definitions/Dam Classifications

A dam is “any barrier, including one for flood detention, designed to impound liquid volumes and which has a height of dam greater than six feet.” This does not include highway, railroad or other roadway embankments, including low water crossing that may temporarily detain floodwater, levees designed to prevent inundation by floodwater, closed dikes designed to temporarily impound liquids in the event of emergencies, or off-channel impoundments authorized by the Commission in accordance with Texas Water Code, Chapter 26, or the Texas Solid Waste Disposal Act, Texas Civil Statutes Article 4477-7” (TAC 299.1).

Height of dam is “the vertical distance from the effective crest of the dam to the lowest elevation on the centerline or downstream toe of the dam including the natural stream channel” (TAC 299.1).

Dams are classified by size and hazard potential. Hazard classification does not indicate the condition of the dam itself; classifications are determined according to potential for loss of human life and/or property damage upon failure (TAC 299.11):

Size Classification:

[Category Storage (ac-ft) Height (ft)]
Small less than 1000 less than 40
Intermediate 1000-49,999 40-99
Large 50,000+ 100+

Hazard Classification:

[Category Loss of Life Economic Loss]
Low None Expected Minimal – rural areas, limited agricultural improvements
Significant Possible, but not expected Appreciable – predominantly rural areas, damage to isolated homes, secondary highways, interruption of public utilities
High Expected Excessive – near urban areas, expected loss of human life, extensive agricultural, industrial, commercial damage, main highway or railroad damage

a. Abandonment: Not defined.
b. Engineer: Engineer’s must be registered in Texas.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined.
f. Person: Not defined.
g. Repairs: Not defined.
h. Spillway: Not defined.

Program Funding

The Commission shall deposit whatever costs are collected under the Code in the State Treasury, which shall be used to administer and perform the duties under Section 11 (Water Rights) of the Texas Water Code (TWC 12.113). The Commission shall hold all fees, except filing fees, which are paid with an application until such application is granted. If the application is denied, the fees shall be returned to the applicant (TWC 12.114).

Fees and Costs

There are no fees for reviewing construction plans and specifications, or conducting dam inspections during construction.

Fees associated with obtaining a permit to construct a dam and using water from a reservoir include a use fee ($1 per acre-foot for non-irrigation uses) and a storage fee (50 cents per acre-foot of water storage) (ASDSO).
The owner pays for any remedial work ordered by the Commission during construction, or shall reimburse Commission costs for any appropriate actions taken by the Commission to assure compliance with these laws (TAC 299.28). The Commission is exempted from payment of any filing, recording, or use fees under the Water Code (TWC 12.112).

Permit/Approval Process
Construction of a dam or the enlargement, repair, or alteration of an existing dam requiring Commission authorization shall not be commenced prior to the executive director's written approval of final construction plans and specifications. This does not apply to ordinary maintenance or repair (TAC 299.22). A licensed professional engineer registered in Texas must prepare all plans and specifications (TAC 299.4). Minimum spillway design criteria are required and are found in section 299.14 of the TAC regulations. Construction plan and specification requirements are outlined in TAC 299.23, and include maps, location of instrumentation, construction material types, time of completion, and other provisions requested by the Commission.
If, after inspection and evaluation, or at any time during the work progress, the Director determines that changes to the permit are necessary, the owner may be requested to change or amend the approved plans and permit (TAC 299.27). The Director must give written approval prior to any deliberate impoundment of water in a newly constructed or modified dam (TAC 299.29). Upon completion, the owner shall file a certificate with the Director, signed by the engineer in charge of the project, specifying the construction, repairs, or alterations were made according to the approved plans and specifications. The owner must notify the Director upon project completion (TAC 299.30).
Dams must be periodically re-evaluated according to downstream development, and are subject to action as necessary. Hydrologic evaluations shall be conducted from “time to time” to determine the structural integrity of the dam itself and to identify potential problems, and dam reaction to flooding events, normal storage, and minimal overtopping. An active and progressive deteriorating condition is sufficient to find a dam is structurally inadequate (TAC 299.15). The Commission is directed to actively and continually evaluate any outstanding permits and certified filings and to carry out measures to cancel or certify such permits as needed (TWC 12.012).
Dam removal shall be at the owner’s expense, and except for emergencies, only after Director’s approval. Plans and specifications for removal may be required. Removal may also be sought through administrative order from the Commission or an injunction through the Attorney General (TAC 299.51).

Inspection Process
The Commission may inspect any impoundment during construction to determine if being constructed in a safe manner and according to Commission orders (TWC 12.016). Although not expressly stated in the statutes, regulations sections TAC 299.15(a) and (c) imply that existing dams are evaluated and that these evaluations include visual inspections. In determining whether an existing dam poses a threat to human life or health, the Commission shall evaluate condition, potential overtopping, seepage, piping, settlement, erosion, cracking, earth movement, uplift, overturning, failure of bulkheads, gates, spillways, conduits, or any other factors determined to affect dam integrity (TAC 299.2). Inspection of construction work is to be conducted daily by a registered professional engineer experienced in the construction of dams and responsible directly to the owner (TAC 299.26). The executive director may make periodic inspections for the purpose of ascertaining compliance with approved plans and specifications. No fees for inspection are charged by the state. The executive director shall require the owner, at his expense, to perform the work or tests necessary and to disclose information sufficient to
enable the executive director to determine that conformity with the approved plans and specifications is accomplished (TAC 229.26).

**Right of Entry**
Any agent of the Commission may enter onto any person’s land for the purposes of making an investigation under this Code (TWC 12.017).

**Operation and Maintenance**
Dams must be adequately maintained throughout their lives, including operation and maintenance of surveillance and monitoring devices – utilizing standard engineering procedures and techniques, including, but not limited to those used by the Army Corps of Engineers and other government agencies – to detect changes in the dam foundation or appurtenant works. If abandoned at any time, the dam must be removed or breached to eliminate downstream hazards (TAC 299.2).
Interim alternatives to dam upgrading or removal are available, such as temporary repairs, insurance coverage, and downstream warning plans. In determining such alternatives, the Commission shall consider economics, physical and legal restraints, prospect of permanent repair, current use of the facility, degree of risk, and public welfare (TAC 299.6).

**Emergencies/Emergency Action Plans**
The Commission may condemn existing works if their existence or operation may become a public menace or risk to life or property. In cases of proposed condemnation, the Commission shall notify the interested party of contemplated action, allowing for hearing prior to condemnation (TWC 12.015). Emergency orders may be issued, without notice to the owner, directing the owner of a dam to take immediate and appropriate action to remedy situations posing serious threat to human life, health and/or property (TAC 299.61).
As required by emergency management planning, the executive director may request, and/or the Commission may order a dam owner to provide sufficient data to plan for potential effects of failure or malfunction of a dam and/or associated appurtenant facilities (TAC 299.17).

**Owner Non-Compliance/Violations/Penalties**
Existing dams are covered under sections TAC 299.2 and 299.51 of the regulations and under TWC Section 12.052(d). If at any time during construction, enlargement, repair, or alteration of any dam or reservoir the executive director finds that the work is not being done in accordance with approved plans and specifications or in accordance with approved revised plans and specifications, he shall give written notice thereof and direct compliance by certified mail to the owner. If the owner fails to comply with the directive, the executive director may take appropriate action to assure compliance. Failure to comply with approved plans and specifications will be grounds for revocation of the permit and/or civil penalty as provided by law. The Commission may order the structure removed to eliminate any safety hazard to life and property (TAC 299.28). When the Director determines a dam poses a threat to human life or health unacceptable under the rules, he may refer the matter to the Attorney General for injunctive relief or seek an order from the Commission mandating the owner to take appropriate action. An owner who willfully fails or refuses to take appropriate action is liable for a penalty of not more than $1,000 a day for each day the violation continues (TAC 299.2).
TWC 11.082 (a) A person who willfully takes, diverts, or appropriates state water without complying with the applicable requirements of this chapter is also liable to a civil penalty of not more than $5,000 for each day he continues the taking, diversion, or appropriation. (b) The state may recover the penalties prescribed in Subsection (a) of this section by suit brought for that
purpose in a court of competent jurisdiction. (c) An action to collect the penalty provided in this section must be brought within two years from the date of the alleged violation.

Recordkeeping
Dam owners are responsible for the continuous maintenance of records insuring compliance with the approved plans and specifications during construction. Copies of these records are to be furnished to the executive director at monthly intervals during the construction period. Other observations pertaining to dam structural integrity may also be recorded (TAC 229.24). Every month during construction, the dam owner must forward progress reports to the Director, noting the percentage of time used and percentage of work done (TAC 299.25). Upon completion of dam construction, the owner and employed engineer shall submit to the Director a complete set of drawings showing reference marks for future use. Such drawings shall be filed with the Department permanent records (TAC 299.31).

Oversight
Under Section 5.102 of the Texas Water Code, the Commission has the power to hold hearings and to make findings of fact and decisions. Judicial review of Commission acts is provided for in TWC Section 5.351, and judicial remedy for inaction of the Commission is found in TWC section 5.352.

Miscellaneous
a. Complaints to Unsafe Conditions
- Not addressed in the “Dams and Reservoirs” code.
b. Environmental Impact
- Preservation of ecological health is a cited “purpose” in the Water Code.
c. Severability
- Not addressed in the “Dams and Reservoirs” code.
d. Supplemental Reference Materials
  • Texas Water Commission, Guidelines for Operation and Maintenance of Dams in Texas (dam safety manual)
  • Final Report: Executive Director’s Task Force on Dam Safety
  • Inventory of Dams in Texas
  • Embankment Damage Control - Animal Burrows and Lodges
Note: Statutes, Rules, and Publications available online at http://www.tnrec.state.tx.us/water/quantity/flood/dam.html
UTAH

Summary
[Pros] The State Engineer administers the dam safety program. The “definitions” section of the administrative rules is very comprehensive. Due to “limited financial, physical, and human resources, it is necessary to establish priorities for the upgrade of dams”, therefore, the State Engineer is responsible for implementing a program for the investigation of the state's 25 top priority dams (i.e. high hazard dams) each year for the purpose of determining compliance to such minimum standards. The State Engineer may require the owner of a dam or proposed dam – at owner expense -to obtain the services of an independent consultant or team of consultants approved by the State Engineer to consult regarding the adequacy of dam design, construction, and operation if independent review is warranted. The State Engineer may also establish the requisite qualifications for such independent consultants. In addition to hazard classification, dams are also classified according to use: flood control; water storage; (mine) tailings; or other. The State Engineer may exempt certain dams from regulation. There are two processes for permit approval: (1) filing of the application, and (2) submission of plans. The process of plan review by the State Engineer is closely monitored; a formal written procedure must be established by the State Engineer, including how the plans were reviewed, the evaluation, design criteria, and using data or criteria generally accepted by the general dam community. The State Engineer may order cessation of construction or removal or works upon finding of noncompliance with approved plans and specifications. Approved plans may be modified by the State Engineer. Prior to final approval to impound water, the State Engineer may require the owner to compile and submit an emergency action plan and standard operating procedure plan. The State Engineer may require dam owners to maintain records pertaining to the construction, operation, and maintenance of the dam, and require the submittal of reports regarding maintenance, operation, or instrumentation readings, or any other data considered necessary by the State Engineer. The State Engineer may, upon inspection revealing unsatisfactory conditions, issue orders for: engineering studies; repairs; storage limitations; dam removal; dam breaching; or any other remedy the State Engineer determines is appropriate to protect life and property. Civil penalties not to exceed $5000 per violation may be assessed (each day a separate violation); with persons who violate this chapter responsible for any expense incurred by the State Engineer in abating the violation.

[Cons] The State Engineer must examine dams of significant hazard potential at least once every five years. Program fees and funding are not addressed in the code or administrative rules pertaining to dam safety. Right of entry is not explicitly provided.

Citation and Title
[Administrative Agency] State Engineer

Jurisdiction/Powers of Department
The Utah State Engineer is responsible for the regulation of dams and reservoirs in the State. The State Engineer is responsible for protecting public safety, and he may make rules controlling construction, operation, design, maintenance, repair, removal, and abandonment of dams or reservoirs. (See Utah Code 73-5a-101). Various sections of the Code specify that the State Engineer may make rules governing such aspects of the dam safety program as: exemptions, the use of independent consultants on design, construction and operation considerations, review and
approval of plans, inspection and reporting procedures, revocation of approval, standard operating and emergency action plans. In addition, Utah Code section 73-5a-603 gives the State Engineer the power to intervene in emergencies when the owner cannot be found or is unwilling to take appropriate action.

The State Engineer may require the owner of a dam or proposed dam – at owner expense – to obtain the services of an independent consultant or team of consultants approved by the State Engineer to consult regarding the adequacy of dam design, construction, and operation if independent review is warranted. The State Engineer may also establish the requisite qualifications for such independent consultants (UC § 73-5a-105), which include dams over 50 feet in height and an active storage capacity of over 1,000 acre-feet, dams with a unique problem, in the opinion of the State Engineer, which require independent review, dams whose design is not normally built in the state and may be beyond the technical capabilities of the State Engineer and other available dam staff, dams with which the owner’s engineer and State Engineer disagree on the dam design, or when the owner specifically requests and independent consultant review (R655-10-7A). The State Engineer may also request independent review (R655-10-7).

All independent consultants must have a minimum 10 years experience related to dams, and if engineers they need to be licensed in the state they reside unless exempted by the State Engineer, must demonstrate expertise to investigate problems identified, and that they have insignificant past association with the dam in question (R655-10-7E). R655-10 also addresses the requirement for obtaining a second opinion of critical design topics as part of the approval process.

Liability and Immunity

Section 63-30-10 of the Utah Code waives immunity from suit for all State government employees except in the case of several types of government duties and functions, including "intervening during dam emergencies". UC § 73-5a-502 states that the State and its officers and its employees are immune from suit for any injury or damage resulting from the exercise or performance or the failure to exercise or perform any function pursuant to this chapter. Section 73-5a-103 states that the legal obligations and liabilities incident to the ownership or operation of a dam shall rest with the owner or operator.

Definitions/Dam Classifications

Utah defines the term *dam* as "any artificial barrier or obstruction, together with appurtenant works, if any, which impounds or diverts water". All dams constructed in the State are subject to regulation unless they impound less than 20 acre-feet of water and do not constitute a threat to human life if they fail. In addition, certain federal dams are exempt from state regulation. (See Utah Code 73-5a-101 and 102.) Hazard Classification of a dam categorizes a dam based upon the consequences of dam failure, and is determined by the State Engineer (R655-10-5). Classes are determined based upon threat to human life or property and downstream development, though may not be an absolute indicator of the hazard of the dam as dam failure combined with natural flooding may incrementally increase potential damages.

*High Hazard* - those dams which, if they fail, have a high probability of loss of life, extensive economic loss, including damage to critical public utilities

*Moderate Hazard* - those dams which, if they fail, have a low probability of causing loss of human life, but would cause appreciable property damage, including damage to public utilities

*Low Hazard* - those dams which, if they fail, would cause minimal threat to human life, and economic losses would be minor, or limited to damage sustained by the owner of the structure

Dams are also classified according to use: flood control; water storage; (mine) tailings; or other (UC § 73-5a-106).
a. **Abandonment:** Not defined.
b. **Engineer:** Engineers must be licensed in Utah, and must be experienced in dam design and construction.
c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** All who own, control, operate, maintain, manage, or propose to construct a dam; also, their agents, lessees, trustees, and receivers.
f. **Person:** Not defined.
g. **Repairs:** Not defined.
h. **Spillway:** An open or closed channel, conduit or drop structure used to convey excess water through a reservoir. It may contain gates, either manually or automatically controlled, to regulate the discharge of water.

**Program Funding**
Program funding is not addressed in the dam safety code or rules.

**Fees and Costs**
Fees are not addressed in the dam safety code or rules.

**Permit/Approval Process**
The permit approval process is addressed in U.C. § 73-5s-201 through 205. No person may construct, enlarge, repair, alter, remove or abandon a dam without first obtaining written approval from the State Engineer. Plans must generally be submitted for approval 90 days before the commencement of the work. The process of plan review by the State Engineer is closely monitored; a formal written procedure must be established by the State Engineer, including how the plans were reviewed, the evaluation, design criteria, and using data or criteria generally accepted by the general dam community (UC 73-5a-203). There are two processes for permit approval: (1) filing of the application, and (2) submission of plans (R655-10-6). Upon the review of the plans according to design criteria specified in the rules and regulations, the State Engineer may approve or reject the plans, or may return them for corrections. Permit applications must include dam location, physical dimensions, water rights attached to the dam, and other information or drawings needed by the State Engineer to properly evaluate the application (UC 73-5a-204). Dams for which the submission of plans is not required must be approved according to the provisions of section 73-5a-204 (no threat to human life, and failure would result only in minor property damage limited to property held by the owner of the structure). Construction must begin within one year after the date of approval unless an extension has been granted, otherwise the approved permit is considered void (UC 73-5a-205). Regulations R655-10 through R655-12 explain extensive guidelines and standards for the preparation of specifications and plans, the design report, minimum design, and seismic design of dams. Design reports are required for all structures in the high and moderate hazard classifications.

The seismic design criteria listed in R655-11 apply to all structures requiring the submission of a plan. If at any time during construction, enlargement, repair, alteration, or removal of a dam the State Engineer finds it necessary to modify approved plans, the State Engineer may do so. The State Engineer may also revoke permits upon revelation that the conditions will not permit the construction of a safe dam (UC § 72-5a-303).

After construction and prior to impoundment of water, the State Engineer shall undertake a final inspection to determine compliance with approved plans and specifications, and that the emergency action plan and standard operating plan meet the requirements set forth by the State Engineer (UC § 72-5a-304).
Appendix E

R655-11 describes the purpose of the rules and regulations as "a general guide for dam construction and repair... intended to provide owners with a fairly complete description of the legal and engineering requirements." Since the technical standards listed in the "Rules and Regulations" apply to a hypothetical dam at a specific site, and are thus rather inflexible, the State recognizes that the plans and specifications of most actual dams would be somewhat different than the model described, especially regarding the use of new materials and techniques. The potential owner is expressly warned that the full burden to show adequate protection with the use of unproven materials or methods rests with the applicant.

R655-11 covers the procedures involved in the removal of a dam.

R655-11 sets forth the minimum design requirements for dams in the State. The design requirements are rigid and allow little latitude in the utilization of new materials and unproven construction methods. The rule includes requirements for hydrologic design, inflow design hydrograph determination, freeboard requirements, spillways, infiltration rates, flood routing, incremental damage assessment for high and moderate hazard dams, and historical records.

R655-11 also sets forth standards for the seismic adequacy of the dam and the progression of the seismic analysis to determine the seismic adequacy. The rule also establishes factors of safety, dam crest requirements, external erosion control, internal erosion control, internal drainage, outlet requirements, outlet sizing, outlet details, and spillway requirements.

R655-11-11 states that abandonment of all dams requires approval by the State Engineer and that if an owner proposes to totally remove a dam, plans should be submitted showing how the original channel is to be reclaimed, how deposited silts are to be controlled, and what methods will be used to revegetate the reservoir basin and riparian areas. The rule also sets forth the requirements for breaching of a dam.

**Inspection Process**

[State] Construction inspections are provided for in Utah Code 73-5a-301 through 304. To ensure compliance with approved plans and specifications, the State Engineer conducts periodic inspections during construction, enlargement, repair, alteration or removal of a dam. The owner is responsible for conducting necessary tests and disclosing pertinent information, and for providing adequate supervision of the work. The supervising engineer submits weekly progress reports to the State Engineer. If the State Engineer finds that the work is not being done in compliance with approved plans and specifications, he may order that no further work be done until compliance has been effected and approved, or until the plans are modified and approved. Failure to comply may result in the revocation of approval or orders for the removal of the incomplete structure. Changes to the plans or revocation of approval may also be ordered if dam site conditions differ markedly from those originally planned for or if they would not permit the construction of a safe dam. A final inspection is conducted following construction and prior to the impoundment of water.

Utah Code sections 73-5a-501 through 503 sets up a program of periodic maintenance inspections for existing dams. The State Engineer must examine dams of significant hazard potential at least once every five years.

If, upon inspection, the State Engineer finds a deficiency, he may issue an order for engineering studies, repairs, storage limitations, removal or breaching.

R655-12 describes inspections to be conducted jointly by the owner and the State Engineer (or their representatives) during the initial filling of newly completed or repaired dams. R655-11 provides details on reporting requirements for construction and maintenance inspections, and for the preparation of "as-constructed" plans. Under R655-11-12, the State Engineer will monitor construction of approved projects. The State Engineer may make periodic inspections to determine compliance with plans, during the course of constructing, enlarging, repairing or removing a dam. And, before any dam can be placed in operation a final inspection of the project.
must be undertaken by the State Engineer and his written acceptance of the project received. R655-11-12E.
The State Engineer is responsible for implementing a program for the investigation of the State's 25 top priority dams (i.e. high hazard dams) each year for the purpose of determining compliance to such minimum standards. These standards are basically the same as the design criteria for new dams, for spillway capacity, seismic stability and static stability (UC § 73-5a-502).

[Owner] During construction the dam owner must provide adequate supervision of the work by an engineer licensed in the state who has experience in dam design and construction. During construction the engineer employed by the owner must submit weekly reports to the State Engineer showing the work accomplished and summarizing the results of any material testing (UC S 73-5a-301).

Right of Entry
Not explicitly addressed in the code or rules.

Operation and Maintenance
Routine maintenance of the structure does not require approval from the State Engineer (UC § 73-5a-201). The State Engineer shall require owners to prepare and submit standard operating plans for their dams, and may require the submission of any other reports regarding dam maintenance and operation.

The State Engineer responsible for setting minimum maintenance and operating standards for dams, and may issue orders for: engineering studies; repairs; storage limitations; dam removal; dam breaching; or any other remedy the State Engineer determines is appropriate to protect life and property (UC § 73-5a-503). All high and moderate hazard dams require initial filling plans for their first cycle of complete filling and draining following construction, enlargement, or repairs which involve substantial excavation of the dam. R655-12-3. All information generated during the initial filling should be submitted to the State Engineer on a frequency to be determined by the State Engineer. All dams that have a hazard designation of high or moderate requiring submission of plans, must have a standard operating plan approved by the State Engineer. R655-12-4. All operation reports produced by the owner or his engineer must be submitted to the State Engineer, upon his request, within 30 days.

Emergencies/Emergency Action Plan
Section 73-5a-601 requires owners of dams which, in the State Engineer’s opinion, may pose a threat to life or cause significant damage to property, to submit emergency action plans, the contents of which shall be determined by rules adopted by the State Engineer.

The State Engineer is authorized in 73-5a-603 to intervene in dam emergencies if the owner cannot be found or fails to take action, including: alerting the appropriate public safety entities, draining the reservoir, hiring personnel or leasing equipment to undertake emergency operations; or taking other steps necessary to safeguard life and property. Expenses incurred in undertaking emergency operations shall be reimbursed by the owner.

Regulation 16 requires that in case of an emergency where repairs are necessary to safeguard life and property, the State Engineer be notified of proposed repairs and remedial work, and that the work be in compliance with state orders.

Under R655-12-6, all owners of high hazard dams shall prepare, maintain, and exercise an emergency action plan. The emergency action plan shall include: 1) a notification flowchart for informing emergency support agencies, downstream interests, and the State Engineer; 2) a dam failure inundation map of a suitable scale and with sufficient topographical information; 3) procedures to identify possible emergencies, at what level an emergency action is initiated, and who is responsible for making necessary contacts; and 4) a list of available materials, equipment,
and manpower which can be activated on short notice to deal with possible emergencies or to mitigate damage following a dam failure.

**Owner Non-Compliance/Violations/Penalties**

Upon finding of non-compliant works during construction, the State Engineer shall notify the owner of the violation, order the owner to comply with approved plans and specifications, or approve the modification to the approved plans and specifications (UC § 73-5a-701). The State Engineer may also order the works to be stopped. Permit revocation and removal of the structure are also available enforcement tools (UC § 73-5a-302). Enforcement and Penalties are addressed in Utah Code 73-5a-701 and 702. After proper notification, the State Engineer may issue an order for necessary corrective action and file an action in district court against any person violating any requirement of the dam safety statutes. Civil penalties not to exceed $5000 per violation may be assessed; with persons who violate this chapter responsible for any expense incurred by the State Engineer in abating the violation. Civil liability for claims arising out of any act which is also a violation are not precluded (UC § 73-5a-702).

Section 73-5a-503, Reports on Dams and Maintenance Responsibility, provides that the State Engineer may revoke the permit and remove the dam of any owner who lets his structure deteriorate and remain in an unsafe condition after the State Engineer has ordered repairs.

**Recordkeeping**

The State Engineer may require dam owners to maintain records pertaining to the construction, operation, and maintenance of the dam, and require the submittal of reports regarding maintenance, operation, or instrumentation readings, or any other data considered necessary by the State Engineer (UC § 73-5a-401). Under R655-11-12C, written documentation of all construction activities should be maintained by the owner’s engineer.

**Oversight**

Decisions of the State Engineer may be appealed through administrative procedures or judicial action. R655-14 sets forth administrative procedures for enforcement proceedings before the division of water rights.

**Miscellaneous**

a. **Complaints to Unsafe Conditions**
   - Not explicitly addressed.

b. **Environmental Impact**
   - Not explicitly addressed.

c. **Severability**
   - Not explicitly addressed.

d. **Supplemental Research Material**
   - Not explicitly addressed.
VERMONT

Summary
[Pros] The statute applies to any individual, corporation, trust, municipality, State or Federal agency, and any other legal or commercial entity. Engineers must be professional certified engineers with experience in dam design and investigation. Stream/waterway alteration permits are required in addition to any permit under this Section. Applicants must also notify the governing body of the municipalities in which the dam or part of the dam is located. Upon receipt of application, DEC shall provide notice of the proposed project to all persons of interest and hold hearings as prescribed. Vermont seems very concerned with ensuring each proposed project receives full public support and benefits the local communities as much as practicable. Permits are not granted unless the public good is served, with provisions allowing for conditional approvals. With approval from the Governor, DEC or the jurisdictional agency may employ a competent hydraulic engineer to investigate the property, review plans, and make additional recommendations to such agency. Dam owners who do not comply with court or agency orders may be subject to de-ownership of the dam under eminent domain, for the protection of public good. Eminent domain themes are pervasive throughout the statute, evidenced by a provision referencing federal funding for the exercise of such powers. The fish and wildlife commissioner shall investigate any effects a proposed project will have on fish and wildlife habitats and provide the results to the jurisdictional agency. Salmon are specifically protected under the statute.
[Cons] Jurisdiction of dams designated as part of an “agricultural enterprise” is transferred to another agency, potentially allowing for such dams to avoid Department regulation. Vermont has not promulgated any regulations on dam safety, governing dam safety via the Vermont Statutes Annotated. The State must pay for costs associated with stream obstructions and maintaining a safe water flow.

Citation and Title
[Rules/Regulations] The State has not promulgated rules and regulations relating to dam safety.
[Administrative Agency] Agency of Natural Resources, Department of Environmental Conservation, Facilities Engineering Division

Jurisdiction/Powers of Department
10 VSA Section 1081 confers the powers and duties authorized by the law to DEC of Environmental Conservation (DEC), except in the case of dam projects used in the generation of electric energy for public use, which are under the jurisdiction of the Public Service Board. Jurisdiction over such structures can be transferred from the DEC to the appropriate agency under 10 VSA 1081.
DEC has specific responsibilities (described in various sections of the statutes) including approval of applications for the construction, enlargement, or alteration of a dam (10 VSA 1082); employment of qualified engineers to review plans and specifications (10 VSA 1083); and initiation of investigations and public hearings on unsafe dams (10 VSA 1085. In addition, DEC is authorized to take action in emergency situations, bring suit to obtain compliance with the law or an order issued pursuant thereto, and implement a program of dam inspection. Special provisions governing agricultural dams (e.g. dams used for farming enterprises, plantations, orchards – excluding timber growth) are set out in 10 VSA Section 1083a;
transferring jurisdiction over such structures to the natural resources conservation district in which the dam is located. Such districts may employ DEC assistance, and the DEC may resume jurisdiction over such structures if there is a change in use or change in ownership affecting use. The fish and wildlife commissioner shall investigate any effects a proposed project will have on fish and wildlife habitats and provide the results to the jurisdictional agency prior to any hearings discussing public safety and benefit (10 VSA 1084).

Federal flood control projects may not affect villages or cites within the State. Adequate compensation shall be made to any town substantially adversely affected by such flood control projects due to loss of revenue. When agricultural lands are taken for flood control, DEC may hold public hearing to notify interested parties, and report its findings and recommendations to the appropriate federal agency (10 VSA 1100).

Liability and Immunity
Under the description of the dam inspection program (10 VSA Section 1105), it is stated that the inspections by DEC do not relieve the owner of his legal duties, obligations or liabilities incidental to the ownership or operation of the dam.

Definitions/Dam Classifications
There are no statutory definitions of the terms dam and dam height. Dam height is described in the instruction for application for authorization to construct or alter a dam, as "the vertical distance from the lowest point along the downstream toe of the dam to the top of the non-overflow part of the structure". Dams subject to State regulation are those which are or will be capable of impounding more than 500,000 cubic feet of water, including any accumulated sediments (10 VSA 1082). Unsafe dams, according to 10 VSA Section 1095, can be of any size.

DEC classifies dams according to the potential loss resulting from failure, and uses the Downstream Hazard Classification system recommended by the US Army Corps of Engineers. Class 3/Low Hazard Dams are those, the failure of which is not expected to result in either loss of life or any economic loss.

Class 2/Significant Hazard Dams are those, the failure of which could result in a few deaths and appreciable economic loss.

Class 1/High Hazard Dams are those, the failure of which could result in more than a few deaths and excessive economic loss.

a. Abandonment: Not defined.
b. Engineer: Engineers must be professional certified engineers with experience in dam design and investigation.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: Not defined; see “Person”.
f. Person: Any individual; partnership; company; corporation; association; joint venture; trust; municipality; the state of Vermont or any agency, department, or subdivision of the state, any federal agency, or any other legal or commercial entity.
g. Repairs: Not defined.
h. Spillway: Not defined.

Program Funding
The eminent domain provision receives federal funding through 33 U.S.C., which declares that all sums of money received from the federal government under 33 U.S.C., Section 701c-3 (Payment to States of proceeds of lands acquired by the U.S. for flood control, navigation, and allied purposes) shall be distributed to the municipality or political subdivision in which such dams or
reservoirs are located. Such moneys shall be distributed by the receiving department (10 VSA 1102).

A special Vermont unsafe dam revolving loan fund is established under this statute to provide grants and loans to municipalities, nonprofit entities, and private individuals to reduce the threat of unsafe dams. This fund shall be separate from any other State fund and shall be administered exclusively for the purposes of furthering dam safety. The fund shall be invested as permitted for funds belonging to the State or State Treasury. The funds shall consist of appropriations from the general assembly, principle interest received from loan repayment, federal grants and awards, investment interests, private gifts and donations, and other funds from public and private sources to further the statutory objectives.

Fees and Costs
A fee of 0.5% of the construction cost with a minimum of $200.00 must be submitted with the application.

Permit/Approval Process
10 VSA Section 1082 requires persons wishing to construct, enlarge, raise, lower, remodel, reconstruct, or otherwise alter any dam to first obtain approval from DEC. “Persons” include individuals, partnerships, companies, corporations, associations, joint ventures, trusts, municipalities, the State or any State agency, department, subdivision, any federal agency, or any other legal or commercial entity (10 VSA 1080). Section 1083 lists the types of information required as part of the application process – dam location, dimensions, plans for construction, alteration, lowering, raising, removal, or addition, changes in operation or maintenance procedures, other relevant information – and requires that plans and specifications be prepared under the supervision of a professional registered engineer and submitted in writing to DEC.

Applicants must also notify the governing body of the municipalities in which the dam or part of the dam is located. Engineers must be professional certified engineers with experience in dam design and investigation (10 VSA 1080). Upon the receipt of an application, DEC is required to properly notify all persons interested, and may hold a public information meeting on the proposal. “Persons of interest” are defined as those persons with riparian rights affected by the dam, persons with interests in the dam, or whose safety is endangered by dam failure (10 VSA 1080).

Issuance of an order of approval is contingent upon the finding that the proposed project will serve the public good and provide for the public safety. Conditions and definitions of “public good” mean the greatest public benefit, and include: quality of agricultural land, recreational activities, fish and wildlife, water quality and water flow, creation of navigation hazards, timber removal from flow area, State, local, and federal plans, and public safety (10 VSA 1086). In its approval order, DEC may include conditions necessary to ensure public good is attained.

A registered professional engineer must review and approve the application, and shall report his/her findings to DEC (10 VSA 1087).

Instructions for completing the application for authorization to construct or alter a dam include the requirements for soils testing, hydrology and hydraulics studies, breach analysis, and the recommendation that spillways be designed according to criteria set forth by federal agencies, (US COE, SCS, BOR). With approval from the Governor, DEC or the jurisdictional agency may employ a competent hydraulic engineer to investigate the property, review plans, and make additional recommendations to such agency (10 VSA 1089).

Once a permit is issued, the construction must be supervised by a registered professional engineer – usually the design engineer – who must certify that the dam is built in accordance with the approved plans and specifications (10 VSA 1090).

Under 10 VSA, Chapter 41, stream alteration permits are also required for projects impacting State waterways.
Inspection Process
The inspection of dams program is authorized in 10 VSA Section 1105. DEC is responsible for employing an engineer to make periodic inspections of nonfederal dams in the State. The intended frequency of such inspections is every year for Class 1 dams, every 1-3 years for Class 2 dams, and every 5-10 years for Class 3 dams. DEC may increase the frequency of such inspections or may make non-routine inspections as warranted. A report on the findings and recommendations is provided to the owner upon completion of the inspection. DEC may initiate investigations regarding the safety of a dam upon its own motion or upon the receipt of a petition signed by 10 persons of interest or by the legislative body of an affected municipality. State inspections do not relieve owners from the legal responsibility incident to dam ownership, and they are expected to conduct inspections on a frequent basis.

Right of Entry
Upon emergency or dam owner noncompliance with agency orders, the jurisdictional agency may take measures necessary to protect the public good.

Operation and Maintenance
DEC may contract for investigation and removal of sandbars, debris, or other waterway obstructions posing a menace in time of flood, endangerment to life or property downstream or property of riparian owners. Cost of such works shall be paid by the State from funds provided for that purpose (10 VSA 1098).

Emergencies/Emergency Action Plans
Procedures for emergency action are described in 10 VSA 1095. An agency having jurisdiction may, upon receipt of petition signed by ten (10) or more persons of interest or local legislative body, institute investigations of suspect structures, of any size. A public hearing may be held – where the investigating engineer may present his/her findings – after which DEC may order the reconstruction, repair, removal, breaching, or draining of the dam, or any other action required to restore the safety of the structure. If the dam presents an imminent danger to human life or property, DEC is authorized to take whatever action it considers necessary to protect life and property (10 VSA 1095).

Owner Non-Compliance/Violations/Penalties
Enforcement of the dam safety provisions is covered in 10 VSA Section 8001 et seq., which deals with the enforcement of various environmental laws. If the owner fails to comply with an agency order within the time limits, DEC may petition the courts for enforcement of the order, including the exercise of eminent domain to acquire the necessary rights to perform the works required to protect public good (10 VSA 1095). The Secretary may bring action against dam owners to seek reimbursement to the Vermont unsafe revolving dam fund for all loans made pursuant to 10 VSA 1106.

Recordkeeping
A report on the findings and recommendations is provided to the owner upon completion of the inspection.

Oversight
10 VSA Section 1099 provides that persons aggrieved by a department decision may appeal to the water resources board. The water resources board may hold a de novo hearing and shall issue an order affirming, reversing or modifying the act of decision of DEC. Appeals from orders of the
water resources board may be taken to the superior court, and from the superior court to the supreme court.

**Miscellaneous**
10 VSA Sections 1100 through 1103 address cooperation with federal agencies, the State's policy with reference to flood control development, and the process for approval for flood control dams.

- **Complaints to Unsafe Conditions**
  - The dam safety laws and regulations do not specifically address complaints to unsafe conditions.

- **Environmental Impact**
  - According to the provisions of 10 VSA Section 1084, the fish and wildlife department is required to investigate the potential effects of proposed dams on nearby fish and wildlife habitats. In addition, under 10 VSA Section 1097, DEC is to survey all dams in the State that impound more than 300,000 cubic feet of water to determine if they adversely affect the preservation and propagation of salmon. If the board finds that the location or operation of a dam does have such an adverse effect, it may order changes in the dam operation.

- **Severability**
  - The dam safety laws and regulations do not specifically address severability.

- **Supplemental Reference Materials**
  - The dam safety laws and regulations do not specifically address supplemental reference materials.
Virginia

Summary
[Pros] The Code of Virginia (C.V.) and the Dam Safety Regulations (Regs.) are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. Importantly, the Regulations establish the Soil and Water Conservation District Dam Maintenance, Repair, and Rehabilitation Fund. The Fund is comprised of moneys appropriated to the Fund by the General Assembly and any other moneys designated for deposit to the Fund from any source, public or private. The Regulations require owners of Class I, II, and III impoundment structures, to obtain operation and maintenance certificates. The laws focus primarily on the permit application process and what information must accompany the permit application including design requirements, plans and specifications and acceptable procedures.

[Cons] The law regarding inspection of structures is convoluted. Under the law, both the department and the owner are responsible for inspections during construction, alteration, operation and maintenance of a dam. It is unclear which party bears the greater burden of inspection as the law does not establish an inspection schedule. Although the Regulations establish a Fund, no permit application fees or annual fees are assessed. The “Definitions” section provides minimal definitions.

Citation and Title
[Statute] Virginia's Dam Safety Act is contained in Article 2, Chapter 6, Title 10.1 of the Code of Virginia (C.V.)
[Rules/Regulations] The Virginia Soil and Water Conservation Board regulation § 4VAC50-20 (formerly VR 625-01-00) entitled "Impounding Structure Regulations" (Reg.) became effective February 1, 1989.
[Administrative Agency] The Virginia Soil and Water Conservation Board

Jurisdiction/Powers of Department
The Virginia Soil and Water Conservation Board is responsible for the dam safety program in that state, and under C.V. § 10.1-605, has the authority to promulgate regulations to ensure the proper and safe construction, maintenance and operation of impounding structures. Other powers of the Board include: the authority to delegate to the director or his designee any of the powers and the duties vested in the Board, except the adoption and promulgation of regulations or the issuance of certificates; the power to create local advisory commissions to consult on permit applications (if requested by local governing boards); the authority to conduct safety inspections of dams, and issue administrative orders directing dam owners to correct deficiencies within reasonable time limits; the authority to declare an emergency if a dam is threatening the safety of life and property; and the right of entry upon property for the purpose of conducting inspections or tests. See C.V. §§ 10.606 to 10.610.

In addition, C.V. § 10.1-611 gives the Board the authority to coordinate all impoundment safety activities in the Commonwealth, and lists duties relating to such authority. These include: maintenance of an inventory of all impoundment structures, including record drawings, safety inspection reports, and emergency action plans; providing technical assistance in the development and implementation of emergency action plans; and inspecting state-owned or state-licensed dams. Finally, C.V. § 10.1-612 and 613 allow the Board to establish an Impoundment Safety Technical Advisory Committee and to institute court proceedings compelling persons or entities to comply with Board-issued orders.
Under C.V. § 10.1-613.5, the Board is authorized to establish and collect application fees from any applicant to be deposited into the Flood Prevention and Protection Assistance Fund for administration of the dam safety program.

Liability and Immunity
Reg. 4VAC50-20-20 (A) states, "[t]his regulation shall not be construed or interpreted to relieve the owner or operator of any impoundment or impounding structure of any legal duties, obligations or liabilities incident to ownership, design, construction, operation or maintenance." The owner shall be responsible for liability for damage to the property or other or injury to persons, including, but not limited to, loss of life resulting from the operation or failure of a dam. C.V. § 10.1-613.4
An owner may not bring an action against the Board, the department or agents or employees of the Commonwealth for the recovery of damages caused by the partial or total failure of a dam or reservoir, or by operation of a dam or reservoir, or by an act or omission in connection with: issuance of plans, issuance or enforcement of orders, control of the dam, protection, investigations or inspections, use of design criteria prepared by the department, or determination of the hazard classification. C.V. § 10.1-613.3.

Definitions/Dam Classifications
According to C.V. § 10.1-604 of the Dam Safety Act, Impounding structure is defined as "a man-made device, whether a dam across a watercourse or other structure outside a watercourse, used or to be used to retain or store waters or other materials." The term includes (i) all dams that are 25 feet or greater in height and that create an impoundment capacity of 15 acre-feet or greater, and (ii) all dams that are six feet or greater in height and that create an impoundment capacity of 50 acre-feet or greater. The term height is defined in the same statute as "the vertical distance from the natural bed of the stream or watercourse measured at the downstream toe of the dam to the top of the dam".
Reg. VAC50-20-40 describes the size and hazard potential categories into which dams are classified.

Class I Hazard Potential: are located where failure will cause probable loss of life or serious damage to occupied buildings, industrial or commercial facilities, important public utilities, main highways or railroads.

Class II Hazard Potential: are located where failure could cause possible loss of life or damage to occupied buildings, industrial or commercial facilities, secondary highways or railroads or cause interruption of use or service of relatively important public utilities.

Class III Hazard Potential: are located where the failure of the impounding structure would cause no property damage to others. No loss of life is expected.

Class IV Hazard Potential: are located where the failure of the impounding structure would cause no property damage to others. No loss of life is expected.

Size and hazard potential classifications are proposed by the owner, subject to approval by the Director of the Department of Conservation and Recreation and subject to reclassification as necessary.

a. Abandonment: Not defined.
b. Engineer: Not defined.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: The owner of the land on which an impounding structure is situated, the holder of an easement permitting the construction of an impounding structure and any person or entity agreeing to maintain an impounding structure. The term “owner” includes the Commonwealth or any of its political subdivisions, including
but not limited to sanitation district commissions and authorities. Also included are any public or private institutions, corporations, associations, firms or companies organized or existing under the laws of this Commonwealth or any other state or country, as well as any person or group of persons acting individually or as a group.

f. **Person:** Not defined.
g. **Repairs:** Not defined.
h. **Spillway:** Not defined.

### Program Funding

C.V. § 10.1-611.1 established the Soil and Water Conservation District Dam Maintenance, Repair, and Rehabilitation Fund ("the fund"). The Fund is comprised of moneys appropriated to the Fund by the General Assembly and any other moneys designated for deposit to the Fund from any source, public or private. The Fund is established on the books of the Comptroller and the moneys shall be paid into the State Treasury and credited to the Fund. Interest earned on moneys in the Fund shall be used solely for (i) the maintenance and repair of any dams owned by soil and water conservation districts and (ii) the rehabilitation and major repair of Class I and Class II dams owned by soil and water conservation districts, in order to bring such dams into compliance with regulations. Expenditures from the Fund made under clause (ii) of this subsection may include, but are not limited to, the following repairs to the infrastructure of a dam: increasing the height of a dam, modifying the spillway, and reducing wave erosion of a dam’s inside face. Expenditures and disbursements from the Fund shall be made by the State Treasurer on warrants issued by the Comptroller upon written request signed by the Director of the Department of Conservation and Recreation.

### Fees and Costs

State regulations do not require filing fees or annual fees.

### Permit/Approval Process

Part II of the regulations describes in detail the permit requirements for the construction or alteration of dams. The first step in the process of applying for a construction permit is the submittal of a general description of the project in order to receive approval of the project concept from the director. This preliminary approval is not required but is encouraged. Applications for construction permits are required and include a detailed design report, the contents of which are specified in Reg. 4VAC50-20-70 (B). Among the types of information required for the design report are: a proposed classification for the structure, stability and seepage analysis, spillway design calculations, an emergency action plan, an operation and maintenance plan (which includes a safety inspection schedule), and plans and specifications which must be developed in accordance with Reg. 4VAC50-20-310. Reg. 4VAC50-20-310 says that "the plans and specifications for a proposed impounding structure shall consist of a detailed engineering design report that includes engineering drawings and specifications", and indicates minimum criteria for such. Design requirements are described in Part V of the regulations, and include specifications for the design of structures, emergency and principal spillways and outlet works, and drains. In addition, Reg. 4VAC50-20-320 lists acceptable design procedures and references from such sources as the US Army Corps of Engineers, the USDA Soil Conservation Service and others.

The schedule for the permit process is as follows: within 60 days of submission, the director must inform an applicant whether an application is acceptable and what changes, if any are necessary for acceptance. Within 120 days of receipt of an acceptable design report, the board must act on an application. The director must approve changes from the approved design, plans or construction schedule. Construction must commence within two years after the issuance of the permit. The director must acknowledge, within 10 days, a statement by the owner's professional engineer that the structure may safely impound water, and the impoundment may be filled. The
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acknowledgment shall serve as a temporary operation and maintenance certificate until one has been applied for and issued in accordance with Reg. 4VAC50-20-110. Reg. 4VAC50-20-70 (J) describes the conditions under which the director may revoke a permit and order corrections or modifications to the structure. Any corrective measures ordered must be made at the owner’s expense. Reg. 4VAC50-20-80 of the regulations describes the process of applying for a permit to alter an impounding structure. State regulations do not require filing fees or bonds relative to the permit process.

Inspection Process
[State]
The Board is authorized by law to create schedules for inspection of dams as it deems appropriate depending on such factors as the condition of the structure and its size, type, location and downstream hazard potential. C.V. § 10.1-607. The Regulations require periodic inspections during construction, alteration or operation under the supervision of a professional engineer at intervals not greater than that required for the updating of certificates. The law requires the department to make periodic inspections during the maintenance, construction, or alteration of any dam or reservoir. C.V. § 10.1-610.1. The director is also authorized to make additional inspections during construction, alteration or operation as deemed necessary. Within a reasonable time after completion of a safety inspection, the Board shall issue a report to the owner of the impounding structure containing its findings and recommendations for correction of any deficiencies which could threaten life or property. C.V. § 10.1-609. The director shall have the authority to issue an administrative order directing the owner to commence implementation and completion of such recommendations according to the schedule contained in the report with modifications as appropriate.
The Board may require inspections after a complaint is registered concerning the threat of danger from the construction, maintenance or operation of a dam.
There are no fees established for inspection by law or rule.
[Owners]
The owner is responsible for providing adequate inspections during construction and operation and maintenance. The owner shall employ a registered professional engineer to supervise all professional engineering inspections. At a minimum, an annual owner’s inspection shall be conducted when a professional inspection is not required.
Owners are required to provide for an inspection after overtopping of any structure. Reports on all owner inspections shall be filed with the Board. Reg. 4VAC50-20-180.

Right of Entry
The Board and its agents and employees shall have the right to enter any property at reasonable times and under reasonable circumstances to perform such inspections and tests or to take such other actions it deems necessary to fulfill its responsibilities. Regarding inspections, the Board or its agents or employees shall make a reasonable effort to obtain the consent of the owner of the land prior to entry. If entry is denied, the Board may apply to a magistrate whose territorial jurisdiction encompasses the property to be inspected or entered, for a warrant authorizing such investigation. C.V. § 10.1-610.

Operation and Maintenance
Operation and Maintenance Certification Process Part III of the regulations requires owners of Class I, II, and III impoundment structures, to obtain operation and maintenance certificates. To receive such certificates, owners of newly built dams must submit required documents within 180 days after completion of the construction. Within 60 days of receipt of the required documents, the Board shall issue an operation and maintenance certificate. Reg. 4VAC50-20-110. For owners of existing impoundment structures, an application shall be filed on official forms and
shall include re-inspection report, inventory report, operation and maintenance plan certified by a professional engineer, and an emergency action plan. Within 60 days of receipt of an acceptable application, the board shall issue an operation and maintenance certificate. Reg. 4VAC50-20-120.

Special provisions for the issuance of operation and maintenance certificates for structures built prior to July 1, 1982 are set forth in Reg. 4VAC50-20-130.

**Emergencies/Emergency Action Plans**
C.V. 10.1-608 and Reg. 4VAC50-20-220 describe the procedures followed when the director finds or is notified of a dam that presents imminent danger to life or property. The first action is to notify the Department of Emergency Services and to confer with the owner about the need to take immediate corrective action. If the owner does not take action to correct the danger found, the Governor has the authority to order and take action when the owner fails or refuses to comply in a timely manner. There shall be a lien upon the owner’s real estate for the Commonwealth’s expenses in removing the imminent danger.

Emergency action plans are required as part of the design report submitted with applications for construction. Reg. 4VAC50-20-70. Plans must be filed with local and State offices of the Department of Emergency Services and must include such information as a method of providing notification and warning to downstream inhabitants, property owners and government officials in the event of a flood hazard or impending dam failure.

**Owner Non-Compliance/Violations/Penalties**
C.V. § 10.1-613 and Reg. 4VAC50-20-200 authorize the board to institute court proceedings against any owner who fails or refuses to comply with orders issued by the board or the director. According to C.V. § 10.1-608, in the case of an owner who does not take appropriate and timely action to correct deficiencies in a dam constituting an imminent danger to life or property, the governor may take immediate appropriate action to remove the danger, and the attorney general may bring court action against the owner, including the placement of a lien upon the owner's real estate for the Commonwealth's expenses. C.V. § 10.1-609 describes the procedures for action in the case of unsafe dams presenting non-imminent danger. See also Reg. 4VAC50-20-220. The director may issue a temporary stop work order on a construction or alteration project if he finds that an owner is constructing or altering a dam without having first obtained the necessary certificate of approval, or if the activities are not in accordance with approved plans and specifications. C.V. § 10.1-612.1.

**Recordkeeping**
Recordkeeping is addressed in other sections.

**Oversight**
C.V. § 10.1-609 provides dam owners who have been served with an administrative order the right to petition the Board for a hearing. Petitions for hearings have the effect of staying the administrative order until a final decision is made. Hearings are conducted before the Board, and owners aggrieved by a Board decision have the right to judicial review pursuant to Virginia administrative process law.

Reg. 4VAC50-20-210 allows for the appointment of independent consulting boards that can assist the Board in answering questions of safety regarding plans and specifications, construction, or operation and maintenance of dams. The consulting boards may be appointed at the request of either the Board or the owner, and the party initiating the request incurs the costs and expenses of such boards.
Miscellaneous
1. Dam owners shall not permit the growth of trees and other woody vegetation and shall remove any such vegetation from the slopes and crest of embankments and the emergency spillway area, and within 25 feet from the toe of the embankment and abutments of the dam. Owners failing to maintain their dam in accordance with this section shall be subject to enforcement pursuant to C.V. § 10.1-613.
2. Prior to the transfer of ownership of a permitted impounding structure the permittee shall notify the director in writing and the new owner shall file a transfer application on official forms. The new owner shall amend the existing permit application as necessary and shall certify to the director that he is aware of and will comply with all of the requirements and conditions of the permit. Reg. 4VAC50-20-100.
   a. Complaints to Unsafe Conditions:
      - No owner shall have the right to maintain an impounding structure which unreasonably threatens the life or property of another person. The owner of any impounding structure found to have deficiencies which could threaten life or property if uncorrected shall take the corrective actions needed to remove such deficiencies within a reasonable time period. Reg. 4VAC50-20-220.
      Upon receipt of a complaint alleging that the person or property of the complainant is endangered by the construction, maintenance or operation of impounding structure, the director shall cause an inspection of the structure, unless the data, records and inspection reports on file with the board are found adequate to determine if the complaint is valid. Reg. 4VAC50-20-230.
   b. Environmental Impact:
      - The dam safety laws and rules do not specifically address environmental impact.
   c. Severability:
      - The dam safety laws and rules do not specifically severability.
   d. Supplemental Reference Material:
      - The dam safety laws and rules do not specifically address supplemental reference materials.
WASHINGTON

Summary
[Pros] The Washington Administrative Code (WAC) is organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. WAC acknowledges the concurrent jurisdiction of other state and federal agencies governing general dam safety and construction (e.g. occupational safety and health). These rules provide a comprehensive “Definitions” section, a sequential summary of the entire dam construction and modification permitting process, and emphasis on assessing the foreseeable consequences of dam failure and magnitude of flooding resulting from such failure. [Owner culpability: Dam owners are required to develop and maintain a current operation and maintenance manual containing the provisions set forth in the Code. Owners are responsible for conducting annual dam inspections, developing and implementing an emergency action plan, and reporting incidents or problems that present a danger to life or property. Dam owners pay for the routine periodic inspections conducted by the Department, but do not have to pay for non-routine inspections.]

The Washington fee/fund system is practical and seemingly provides a balanced account from which Department costs may be expended, while provided for by dam owners. WAC states in numerous provisions that any fees collected for inspections, plan review, or other, shall reflect the true costs to the Department for such work. The State’s Dam Safety Guidelines publication provides supplementary guidance to dam owners, engineers, and shareholders.

[Cons] Though the overall fee/fund mechanism itself is rational, the fee schedule and calculation processes are complex. The Department is required to inspect high hazard dams only once every five years, or more frequently if deemed necessary. Significant hazard dams must only be inspected by the Department once every five or ten years, depending on Department workload or staffing. Low hazard dams are not included in the periodic dam inspection process.

Citation and Title
[Statute] Revised Code of Washington (RCW), Title 43. State Government – Executive, Chapter 43.21A. Department of Ecology; also see Chapters 86.16.035, 90.03.350, and 90.54.160, last amended in 1994.


In addition, the Department of Ecology publishes Dam Safety Guidelines, intended to provide owners, operators and design engineers with information on procedures and statutory requirements. The guidelines are organized into four basic units:
Part I: General Information and Owner Responsibility
Part II: Project Planning and Approval of Dam Construction or Modification
Part IV: Dam Design and Construction
[Administrative Agency] Department of Ecology, Dam Safety Office

Liability and Immunity
The laws and rules do not specifically address owner or departmental liabilities.

Jurisdiction/Powers of Department
Powers and duties of the Department of Ecology [Department] are listed in several sections of the statutes. RCW 86.16.035 gives the Department supervision and control over all dams and stream obstructions, and authorizes the making of regulations necessary for the protection of life and property. Under RCW 43.21A.064, the [Director of the] Department is responsible for inspection
of new construction and modifications and the periodic inspection of existing dams, and is granted the power to require the necessary changes in construction and maintenance to reasonably secure safety to life and property. RCW 43.21A.064 also provides that the Director shall, if requested, provide assistance to applicant for a water right in obtaining or developing an adequate and appropriate supply of water consistent with the land use permitted for the area in which the water is to be used and the population forecast for the area. The Director shall, when required by the Governor, render a full written report of the Department’s work with such legislation as deemed advisable for the better control and development of the water resources of the State (RCW 43.21A.064). RCW 90.03.350 prohibits anyone from constructing or modifying a dam without first applying for and receiving approval from the Department, and allows the Department to order the abatement of dams – through the Attorney General or Prosecuting Attorney of the county wherein such dam is situated – not constructed according to approved plans and specifications. The Department also has the authority to take whatever action is necessary to protect downstream lives and property in an emergency. The Department, when deemed appropriate by the Department, shall report to the legislature any dams exhibiting safety deficiencies sufficient to pose a threat to life and property. This report shall disclose the dam owner’s identity, ability and attitude towards correcting such deficiencies, and shall provide an estimate of the cost to correct such deficiencies (RCW 90.54.160).

WAC 173-175-020 provides that these regulations do not apply to dams under federal control, though the Department continues as the state repository for pertinent plans, reports, and other documents related to the safety of federally owned dams.

Definitions/Dam Classifications

Dam means any artificial or combined artificial and natural barrier or controlling works, together with appurtenant works, which can or does impound or divert water, including water in a slurry state at time of initial containment (WAC 173-175-020).

For purposes of state regulation, jurisdictional dams are those with a maximum storage volume at the dam crest level of 10 or more acre-feet. An exemption is provided for low hazard dams with height 6 feet and under, to be determined by Department (WAC 173-175-020, 030).

The high hazard classification is for those dams with 7 – 300 lives at risk and major to extreme economic and environmental damage, with subcategories of 1C, 1B, and 1A for increasing risk. The significant hazard classification is for dams with 1 – 6 lives at risk, appreciable economic loss, and limited environmental damage. The low hazard classification is for dams with no lives at risk, minimal economic loss, and no environmental damage (WAC 173-175-130).

Classifications are determined by the Department and are subject to change as result of dam inspection (WAC 173-175-705).

a. Abandonment: Not defined.
b. Engineer: “Project Engineer” is defined as a professional engineer licensed in Washington, having direct supervision in managing the engineering aspects of the project as representative of the owner.
c. Hazard Potential: Not defined.
d. Operator: Not defined.
e. Owner: The person holding lawful title to the dam or any person who owns or proposes to construct a dam.
f. Person: Any individual, firm, association, county, public or municipal or private corporation, agency, or other entity whatsoever.
g. Repairs: Not defined.
h. Spillway: A channel structure and/or conduit for the safe release of water or floodwater.
Program Funding

The Washington funding mechanism essentially acts as a fund held by the Department, into which dam owners deposit Department fees or expenses estimated to administer that particular owner’s dam safety program. When a dam transfers ownership, money in that “fund” or “account” is not reimbursed to the owner, it stays with the Department to be used for the same dam, but can be transferred from past to present owner. Fees paid by a previous dam owner shall be deemed to satisfy the corresponding fee payment requirements of a new dam owner (WAC 173-175-795).

Fees shall be collected by the Department for the examination of plans and specifications, subsequent construction inspections, and for permits to modify existing dams – all calculated separately (WAC 173-175-350). Fees for examination of plans and specifications, and inspections shall be collected for the actual cost to the Department for inspection including the expense incident to thereto.

Fees and Costs

The fee to examine construction plans and specifications shall be a minimum of ten dollars or the actual cost to the Department. Fees collected for construction inspections are based upon actual Department costs, factoring in dam height, crest size, and the fiscal growth factor – adjusted and communicated by the Department (WAC 173-175-010, 150, 350, 360, 370). Permit fees for dam modifications depend on the extent of the modifications, and shall be the greater between one thousand four hundred dollars or the amount determined by the fee schedule and table. See WAC 173-175-370 for the fee schedule. Other fees differ depending on dam condition, hazard classification, or abandonment.

An initial, nonrefundable payment representing all or part of the construction permit fee, shall be included with the application form; amount determined according to WAC 173-175-390.

Any expert employed to settle differences between the department and project engineer or owner must be paid by owner (WAC 173-175-400).

Fees for periodic inspections shall be charged to the dam owner, and collected in advance, as prescribed by the fee schedule in this rule. Fees shall represent the Department’s true estimate of performing the inspection, and reflect the Department’s commitment to fully recover all eligible expenses (WAC 173-175-705, 755).

Single annual fees will be charged for impoundments with multiple dams (using the dam with the highest hazard rating) and multicell impoundments, such as wastewater lagoons, where two or more cells are located side-by-side or share a common embankment (again, cell with the highest hazard rating sets the fee calculation rate) (WAC 173-175-765).

Inspection fees shall be charged from the dam owner on record with the Department, even in instance when dam ownership changes hands. Upon transfer of ownership or control of a dam, it shall not be the responsibility of the Department to transfer funds between a new and previous dam owner, and the Department shall not refund fees prospectively in the event of a transfer (WAC 173-175-795). Agreements between a new and previous dam owner are not binding on the Department (WAC 173-175-795).

Permit/Approval Process

Anyone intending to construct or modify a dam or controlling/appurtenant works capable of retaining 10 or more acre-feet of water shall, before beginning such work submit detailed construction plans and specifications, which are to be drawn by a registered professional engineer, to the Department for approval (RCW 90.03.350 and Chapter 173-175). The Department shall review engineering design reports, plans, and specifications to determine that the proposed project will reasonably secure life and property. This review is not intended to address occupational risks to workers during construction (WAC 173-175-160).
Part II of the Dam Safety Guidelines, "Project Planning and Approval of Dam Construction or Modification" describes in detail the progression of the project design phase and the Department's paralleling plan review process. Guidelines for engineering investigations and analyses and the submission of conceptual plans and engineering design reports are included, as are items that should be included in supporting calculations for the construction plans. WAC 173-175-120 states that the Department shall supply the application forms for a construction permit.

At a minimum, the plans and specifications for proposed construction must include project vicinity maps, site map, sectional view along longitudinal axis of the dam, cross-sectional view and profile of dam and spillway, steel reinforcement for concrete construction, diversion/control plan for water during construction, specifications of materials being used, earthen zone moisture conditions, and concrete construction and structural details (WAC 173-175-140).

Engineering design reports – in addition to containing all WAC requirements – must bear the seal and signature of the project engineer, must be sufficiently complete to support the development of plans and specifications without substantial change, and must include a description of the various engineering, geologic, geotechnical, and seismic investigations, including: subsurface explorations, laboratory testing of boring samples, seismotectonic province identification. Engineering design reports must also include an assessment of consequences of dam failure on downstream areas (quantified by the ‘hazard classification’ rating), an estimation of the magnitude of the dam break flood hydrographs resulting from hypothetical dam failures, and a general description of downstream areas that could be affected by floodwater from a dam failure (WAC 173-175-130).

After approval, the return of the construction plans to the owner will be accompanied by a permit, which must be prominently displayed at the construction site (WAC 173-175-1000). Grant of the construction permit does not relieve the owner of responsibility to secure all other applicable permits and approvals before proceeding with construction work (WAC 173-175-180).

Where differences of opinion arise as to the suitability of certain engineering or construction practices, the burden will be on the owner and project engineer to demonstrate suitability of the proposed plan or action (WAC 173-175-170).

As prescribed by WAC 173-175-170, a Construction Inspection Plan shall be submitted to the Department outlining the quality assurance steps taken during construction.

Change of dam ownership, occurrence of an accident at the dam, and periodic inspection require Department notification within the prescribed timeframes. Adoption or alteration of mandated plans and procedures – Operation and Maintenance Plan, Emergency Action Plan – require Department review and acceptance (WAC 173-175-040).

Within 120 days of construction completion, the project engineer shall submit to the Department a construction records summary (WAC 173-175-250).

**Inspection Process**

The Department performs periodic construction inspections of dams according to a schedule based on the size and complexity of the project. Through periodic inspections during the construction work, it is the Department’s role to confirm that approved plans and specifications are followed. Necessary changes to previously approved plans must be authorized by the Department (WAC 173-175-200).

Owners, agents of the owner, or a professional engineer, are required to conduct annual surficial (surface/superficial) inspections of their dam(s). Owners must maintain records of their findings, including actions taken to correct problem conditions, and submit a copy of the annual inspection checklist and other relevant documents to the Department within thirty days of the inspection (WAC 173-175-510).

The Department has authority to conduct routine inspections of all existing dams with high or significant hazard classifications, and shall consist of the components outlined in this provision.
Periodic inspections of existing dams are to be performed by the Department at least every five years for high hazard dams, and every five or ten years for significant hazard dams. Low hazard dams are not included in the periodic inspection program. The Department shall give at least thirty days notice to owner of inspection date and advise owner of any pre-inspection actions, such as opening or closing valves (WAC 173-175-705). The Department may perform non-routine inspections, regardless of hazard classification (WAC 173-175-725). Parts II and III of the Guidelines further define the owner's responsibility for routine maintenance and inspection activities.

**Right of Entry**

The Department or its agents – in compliance with owner’s reasonable rules – shall have right to access the property, public or private, to inspect or investigate conditions relating to construction, operation, maintenance, or performance of dams (WAC 173-175-600).

**Operation and Maintenance**

An Operation and Maintenance Plan (O&M) shall be developed and submitted to the Department for review and approval. This plan – in addition to including the items listed under WAC 173-175-500 – shall outline and summarize how the project is to be operated, and basic elements of monitoring, inspection, and maintenance (WAC 173-175-210, 500). It is not necessary to submit plans and specifications regarding routine maintenance for Department approval (WAC 173-175-380).

**Emergencies/Emergency Action Plans**

According to rules and executive policy covering actions on emergencies, the Department may take whatever action is needed to protect lives and property. Emergency action plans (EAP) are required for all high and significant hazard dams (WAC 173-175-520). It is the duty and responsibility of the owner to implement the EAP when conditions warrant, to coordinate the EAP with local and State authorities, and provide copies of the EAP to such authorities (WAC 173-175-520). An EAP shall include procedures for detecting, evaluating, communicating, and initiating notification or warning to those at risk in downstream/upstream areas (WAC 173-175-220). Owners are required to notify the Department when any incident occurs or conditions arise that may pose a threat to life or property (WAC 173-175-530).

WAC 173-175-610 states that, when the Department determines a state of emergency posing imminent threat to life, the Department may take necessary action to mitigate the hazard or potential consequences. All costs of such actions incurred by the Department resulting from taking control of the project will be charged to the owner. If the Department determines that emergency or exigency conditions exist at a dam, in the interests of public safety the Department may temporarily suspend or alter the normal construction process (WAC 173-175-260).

**Owner Non-Compliance/Violations/Penalties**

Dams constructed or modified in a manner other than in accordance with approved plans and specifications, or which not maintained in accordance with Department orders, may be presumed to be a public nuisance, and may be abated. It is the duty of the Attorney General or prosecuting attorney of the county in which the dam is located to institute abatement proceedings against the owners of the dam upon the request of the Department. To enforce these rules the Department is authorized to issue regulatory orders – including stoppage of dam operations – or civil penalties according to WAC 173-175-620.
Recordkeeping
The Director shall keep records as may be necessary for the recording of financial transactions and statistical data thereof, and shall provide all necessary documents, forms, and blanks (§43.21A.064). Owners must maintain records of their findings, including actions taken to correct problem conditions, and submit a copy of the annual inspection checklist and other relevant documents to the Department within thirty days of the inspection (WAC 173-175-510).

Oversight
All Department decisions pertaining to permitting, regulatory orders, and penalties are subject to review by the Pollution Control Hearings Board (WAC 173-175-630).

Miscellaneous

a. Complaints to Unsafe Conditions
- The Department may inspect a dam upon public complaint; owner shall not be charged for such inspections. A written report of the findings shall be given to the complainant and the owner. Owners are required to correct any noted deficiencies in a timely manner (WAC 173-175-735).

b. Environmental Impact
- Not a main focus of the dam safety laws.

c. Severability
- Not addressed in the dam safety laws.

d. Supplemental Reference Materials
- Washington's Department of Ecology publishes Dam Safety Guidelines, dealing with General Information and Procedures, Project Approval, An Owner's Guidance Manual, Dam Design, and Technical Notes on the selection of design/performance goals and design storms for spillway design. These guidelines summarize for the owner or design engineer all of the laws and rules pertaining to dam safety, and provide details on the state requirements for all phases of design, construction, operation and maintenance of dams.
WEST VIRGINIA

Summary
[Pros] The Code of West Virginia (C.W.V.) and the West Virginia Dam Safety Rules (Rules) are organized in a clear, reasonable, and efficient structure to facilitate regulation inquiries and reference. Under these rules dam owner’s are required to formulate and submit a written maintenance plan to the director and perform safety inspections monthly or more frequently, during the first three years after construction, to survey the dam and its appurtenances for problems or changes. The Rules require permit applicants to pay an application fee of varying amounts, depending on the type of permit. Owners of dams are required to pay annual fees. Permit application fees and annual fees are paid into the Dam Safety Fund. Money deposited into the Fund is earmarked for the review of applications, inspection of dams, payment of costs of remedial emergency action and enforcement of the provisions of this article. The Rules set out design requirements in great detail. The design requirements cover areas including hydrologic, hydraulic, geotechnical, and structural considerations and requirements.
[Cons] No glaring statutory weaknesses.

Citation and Title
[Statute] The West Virginia Dam Control & Safety Act was enacted in 1973 and is contained in Chapter 22-14, Code of West Virginia (C.W.V.). The Act was last amended in 1992.
[Rules/Regulations] Dam Safety Rules are found in Title 47, Series 34 under the Division of Environmental Protection (Rule).
[Administrative Agency] West Virginia Department of Environmental Protection

Jurisdiction/Powers of Department
Responsibility for the dam safety program lies with the West Virginia Department of Environmental Protection (department). Powers and duties of the department (and its secretary) are listed in C.W.V. § 22-14-4, and include the following: (a) to exercise regulatory jurisdiction over dams; (b) to review all applications for certificates of approval for the placement, construction, enlargement, alteration, repair or removal of any dam; (c) to grant, modify, amend, revoke, restrict or refuse to grant any certificate of approval if proper or necessary to protect life and property as provided in this article; (d) to propose, modify, repeal and enforce rules and issue order, to implement and make effective the powers and duties vested in the secretary by the provision of this article; (e) to take any lawful action considered necessary for the effective enforcement of the provision of this article; (f) to establish and charge reasonable fees; (g) to employ qualified consultants; (h) to cooperate and coordinate with agencies of the federal government, this state and counties and municipalities of this state to improve, secure, study and enforce dam safety and dam technology within this state; (i) to investigate and inspect dams as necessary; and (j) to prepare and publish within reasonable time, criteria to govern the design, construction, repair, inspection and maintenance of proposed dams herein defined, and to review these criteria annually in order to consider improved technology for inclusion in such criteria. C.W.V. § 22-14-16 grants the authority promulgate rules, to establish a schedule of application fees, which shall be submitted by the applicant to the department along with the application for a certificate of approval.
Liability and Immunity
C.W.V. § 22-14-12 provides that nothing in the law relieves an owner of a dam of the legal duties, obligations or liabilities incident to the ownership or operation of a dam.

Definitions/Dam Classifications
C.W.V. § 22-14-3 defines the term *dam* as "an artificial barrier or obstruction, including any works appurtenant to it and any reservoir created by it, which is or will be placed, constructed, enlarged, altered or repaired so that it does or will impound or divert water." For purposes of regulation, jurisdictional dams are those which are a) 25 feet or more in height which can impound 15 acre-feet or more of water, or b) six feet or more in height and impound 50 acre-feet or more of water. Dams not under state jurisdiction include federal dams, farm ponds and structures not normally impounding water. Dam height is measured from the crest or uppermost point on the dam to the lowest point in the natural bed of the stream or watercourse at the downstream toe of the dam.

The hazard potential is determined by the applicant and is based upon the potential loss that would result due to a failure.

*Class 1 (High Hazard) Dams* - Class 1 dams are those dams located where failure may cause loss of human life or major damage to dwellings, commercial or industrial buildings, main railroads, important public utilities, or where a high risk highway may be affected or damaged. This classification must be used if failure may result in the *loss* of human life.

*Class 2 (Significant Hazard) Dams* - Class 2 dams are those dams located where failure may cause minor damage to dwellings, commercial or industrial buildings, important public utilities, main railroads, or cause major damage to unoccupied buildings, or where a low risk highway may be affected or damaged. The potential for loss of human life resulting from failure of a Class 2 dam must be unlikely.

*Class 3 (Low Hazard) Dams* - Class 3 dams are those dams located in rural or agricultural areas where failure may cause minor damage to nonresidential and normally unoccupied buildings, or rural or agricultural land. Failure of a Class 3 dam would cause only a loss of the dam itself and a loss of property use, such as use of related roads, with little additional damage to adjacent property. The potential for loss of human life resulting from failure of a Class 3 dam must be unlikely. An impoundment exceeding forty (40) feet in height or four hundred (400) acre-feet storage volume shall not be classified as a Class 3 dam. A waste disposal dam, the failure of which may cause significant harm to the environment, shall not be classified as a Class 3 dam.

*Class 4 (Negligible Hazard) Dams* - Class 4 dams are dams where failure is expected to have no potential for loss of human life, no potential for property damage and no potential for significant harm to the environment. Examples of Class 4 dams include: dams across rivers, failure of which under any conditions will not flood areas above normal streambank elevations; dams located in the reservoir of another dam which, under any conditions, can contain water released by failure of the Class 4 dam; and dams in series where the toe of the Class 4 dam(s) is in close proximity to the reservoir of a dam which can contain failure of the Class 4 dam(s) under any condition. In considering a request for a Class 4 designation, the director may require written concurrence from the owner(s) of downstream dams that may be affected by failure of the Class 4 dam. Approval for use of this classification is vested in the director, and will be based on engineering evaluation of the dam(s) and downstream areas in question.

a. **Abandonment:** To render a dam non-impounding by filling the reservoir created by that dam with solid materials and by diverting the natural drainway around the site.

b. **Engineer:** A person who by reason of his or her knowledge of mathematics, the physical sciences, and the principles of engineering, acquired by professional education and practical experience, is qualified to engage in the practice of professional engineering and holds a current certificate of registration issued by the
State granting its licensee the privilege of practicing professional engineering in accordance with the provisions of C.W.V.

c. **Hazard Potential:** Not defined.
d. **Operator:** Not defined.
e. **Owner:** Not defined.
f. **Person:** Any public or private corporation, institution, association, society, firm, organization or company, organized or existing under the laws of this or any other state or country; the state of West Virginia; any state governmental agency; any political subdivision of the state or of its counties or municipalities; sanitary district; public service district; drainage district; conservation district; watershed improvement district; partnership; trust; estate; person or individual; group of persons or individuals acting individually or as a group; or any other legal entity whatever. The term “person”, when used in this article, includes and refers to any authorized agent, lessee or trustee of any of the foregoing or receiver or trustee appointed by any court for any of the foregoing.
g. **Repairs (Alterations):** Only those changes in the structure or integrity of a dam which may affect its safety, which determination shall be made by the secretary.
h. **Spillway (Principal Spillway):** The hydraulic structure designed to discharge water stored between the normal pool and the emergency spillway invert elevations.

**Program Funding**

“Dam Safety Fund”

All certificate application fees and annual registration fee assessments, any interest or surcharge assessed and collected by the department, interest accruing on investments and deposits of the fund, and any other moneys designated by the department shall be paid into the fund. Accrual of funds shall not exceed three hundred thousand dollars per year, exclusive of application fees. The department shall expend the proceeds of the fund for the review of applications, inspection of dams, payment of costs of remedial emergency action and enforcement of the provisions of this article. C.W.V. § 22-14-18.

**Fees and Costs**

Each application submitted to place, construct, enlarge, alter, repair, remove or abandon a dam shall include an application fee. Rule 47-34-18.

The application fee for placement, construction, alteration, enlargement, repair, or approval of a dam is $300.

The application fee for breaching a dam is $200.

The application fee for removal of a dam is $100.

Owners of existing dams holding certificates of approval shall be assessed an annual registration fee.

The annual fee for:

1. a Class IV dam is $25;
2. a Class III dam is $50;
3. a Class II dam is $75; and
4. a Class I dam is $100.

**Permit/Approval Process**

C.W.V. § 22-14-5 requires that persons wishing to place, construct, enlarge, alter, repair, remove or abandon any jurisdictional dam must first apply for and receive a certificate of approval from the department. Applications must be made on forms prescribed by the department. Plans and specifications for the placement, construction, enlargement, alteration, repair or removal of dams shall be in the charge of a registered professional engineer licensed to practice in West Virginia.
C.W.V. § 22-14-5. Each plan package submitted for approval must contain the following information in this order: (1) existing site conditions; (2) local geology and geotechnical considerations; (3) design life of the dam and its appurtenances; (4) subsidence potential; (5) design techniques with associated design computations and data; (5) environmental protection measures for the control of erosion and sedimentation and for the disposal of construction wastes; (6) method of construction, including clearing and grubbing, topsoil stockpiles, and surface and subsurface drainage structures; (7) phases or sequence of construction; and (8) routine inspection and maintenance procedures and schedules. Rule 47-34-6.4. The plan package shall also include a proposed or recommended sequence of construction, with a schedule listing the anticipated number of working days necessary to accomplish completion. Rule 47-34-6.4. The construction sequence and schedule must cover (1) sediment control measures; (2) clearing and grubbing; (3) road or utility relocations; (4) development of borrow areas; (5) placement of coffer dams or diversions; (6) excavation of foundation areas; (7) excavation of spillways; (8) placement of embankment or structural materials; (9) placement of spillways and appurtenances to spillways; (10) seeding and mulching of the project area; (11) general clean-up of the project area; and (12) other information as requested by the director. The plan package shall also include such information as project specifications and maps and drawings. The Rules set out the design requirements in great detail. The design requirements cover areas including hydrologic considerations and requirements, hydraulic considerations and requirements, geotechnical considerations and requirements, structural considerations and requirements, and miscellaneous considerations. Rule 47-34-7.

C.W.V. § 22-14-7 provides that the director must approve or disapprove an application within 60 days of its receipt, and upon approval shall cause notice of the application to be published in a Class I legal advertisement. Finally, C.W.V. § 22-14-8 authorizes the director, under certain circumstances, to revoke or suspend certificates of approval, or amend the terms and conditions of a certificate. Rule 47-34-5 of the regulations spells out in detail the requirements for applications and the accompanying plans, specifications, maps and drawings. Included in the plans requirements are a project narrative, emergency warning plans, design analysis (including hazard classification, and geotechnical, laboratory, and hydrologic investigations), design requirements (including specifics on design storms, storage and discharge, surface drainage, spillways, and landslide potential). Also, under Rule 47-34-8, “construction of a dam”, are parameters for site development and construction, including site preparation and construction requirements. Rule 47-34-9, contains specific rules for application to breach a dam. Rule 47-34-10 contains specific rules for application to remove a dam. Rule 47-34-11 contains specific rules for application to abandon a dam. Rule 47-34-15, contains rules for operation and maintenance of dams.

**Inspection Process**

[State] The inspection program is authorized under C.W.V. §§ 22-14-9, 22-14-11 and 22-14-4(i). The department conducts construction, enlargement, repair, alteration, and removal inspections to assure compliance with approved plans and specifications. While state personnel carry out these inspections, any tests or work necessary to provide adequate supervision during construction are done at the owner's expense. The department may engage its own engineers or consulting engineers or an engineering organization to make the periodic inspections. If the department finds that the work is not in compliance with approved plans, the director shall notify the owner and order immediate compliance. The owner is required to notify the department upon completion of the dam.

[Owner] The owner of a dam or his or her agent shall perform safety inspections monthly or more frequently to survey the dam and its appurtenances for problems or changes. During adverse weather conditions, the owner shall inspect the dam more frequently. Rule 47-34-15.4. An engineering inspection shall be conducted annually for three years after the completion of any
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Class IV dams shall be inspected at least once every seven years. Class III dams shall be inspected at least once every five years. Class II dams shall be inspected at least once every three years and Class I dams shall be inspected at least once every two years. The owner shall submit a written report containing the observations of each inspection to the director within 30 days of each inspection. The report shall include any maintenance to be performed as a result of the inspection.

Right of Entry
Right of entry is not specifically addressed in the Laws or Rules.

Operation and Maintenance
The owner of a dam shall ensure that his dam is operated in a safe and responsible manner so as to not endanger life or property. Rule 47-34-15. Owners of dams that require the operation of gates, penstocks, or other means of regulating the reservoir level, shall develop and submit an operation plan to the director for approval. Each dam shall be maintained in accordance with the plans and specifications approved under the applicable certificate of approval. In addition, owners shall formulate and submit a written maintenance plan to the director for approval. Rule 47-34-16.

Emergencies/Emergency Action Plan
Procedures for handling dam emergencies are spelled out in C.W.V. § 22-14-10 of the Dam Control & Safety Act. Responsibilities of the owner include determining that an emergency exists, notifying the department and any persons who might be in danger if the dam should fail, and taking immediate remedial action. The department, once all notifications have been made, may take its own remedial action if imminent danger exists and there is not sufficient time to order the owner to correct the condition. The director is authorized to take any of the following actions: a. Taking full charge and control of the dam; b. Lowering the water level or releasing all water impounded by the dam; c. Performing necessary remedial or protective work at the dam site; d. Taking any other steps necessary to safeguard life and property. All remedial work and repairs, whether initiated by the owner or the department, shall be at the expense of the owner. The department may recover such expenses from the owner by civil action if expenses are not repaid by the owner at the department's request. Rule 47-34-15 of the regulations describes the reporting and monitoring requirements in the case of dam emergencies, and the procedures involved in evaluating dangerous conditions.

Owner Non-Compliance/Violations/Penalties
If DEP finds a dam being constructed or operated not in compliance with the terms and conditions of the certificate of approval or with approved plans and specifications, the director may issue an order for immediate compliance and may suspend, modify or revoke the certificate. C.W.V. § 22-14-14. In addition, C.W.V. § 22-14-13 of the statute declares that persons found to be in violation of the law, certificate of approval, order, rule or requirement of the secretary or department is guilty of a misdemeanor, upon conviction thereof, shall be fined not less than $100 nor more than $1000, or imprisoned for not more than six months, or both fined and imprisoned. Persons willfully obstructing the performance of mandated departmental duties, or willfully resisting department authority, or permitting work to be done without a certificate of approval, shall also be guilty of a misdemeanor and fined not less than $1000 nor more than $5000 and/or imprisoned for not more than one year, or both fined and imprisoned. C.W.V. § 22-14-15 includes civil penalties of $200 per day, not to exceed $400.
Recordkeeping
Recordkeeping is not specifically addressed in the Laws or Rules.

Oversight
Under C.W.V. § 22-14-7, persons whose life or property may be adversely affected by the issuance of a certificate of approval has a right to a hearing before the secretary of the department. The secretary, after hearing the evidence presented may either deny the certificate or issue one with terms, conditions and limitations attached. C.W.V. § 22-14-8 requires the department to hold a hearing before any certificate is amended or revoked. Persons adversely affected by such an order shall have the right of appeal to the environmental quality board.

Miscellaneous
1. C.W.V. § 22-14-11 describe the requirements for dams completed prior to the effective date of the statute. The DEP is given authority to order draining of reservoir whose dam is judged to be unsafe.
2. Note should be made of the technical detail contained in the regulations concerning requirements for plans, specifications, maps and drawings. Several types of analysis, surveys, and investigations are included as part of the application process. Spillway and stability criteria are precisely described. In addition, minimum performance standards apply to site preparation, construction materials, grading, spillways and appurtenances. Rules governing the operation and maintenance of dams are also included in the regulations.
   a. Complaints to Unsafe Conditions
      - The dam safety laws and rules do not specifically address complaints to unsafe conditions.
   b. Environmental Impact
      - The dam safety laws and rules do not specifically address environmental impact.
   c. Severability
      - The dam safety laws do not specifically address severability.
   d. Supplemental Research Material
      - The dam safety laws do not specifically address supplemental research material.
WISCONSIN

Summary
[Pros] No owner of any dam may abandon or remove or alter the dam without first obtaining a permit from the Department. W.S. § 31.185. The application shall include the owners name and address, a brief description of the dam and its location and other information, as the department requires for the purpose of enabling it to act on the application. The Department may remove or cause to be removed, in such manner as it deems fit, old and abandoned dams in streams in this State, upon giving 60 days notice in writing to the owner thereof, if the owner can be found. W.S. § 31.187. The department shall charge a permit or approval fee for carrying out its duties and responsibilities. W.A.C. NR 335 establishes a Dam Maintenance, Repair, Modification, Abandonment and Removal Aid Program. Under the program, any municipality or lake district that owns a dam in Wisconsin may apply for State aid for repair, modification or abandonment of the dam. To be eligible, the owner shall request, in writing, financial assistance under this chapter within 6 months after receiving directives or an order for repair, modification or abandonment of the dam resulting from a department investigation or inspection of the dam.

[Cons] The rules do not dictate what responsibility the owner of a dam has to inspect his/her dam. Rather, the statute only expressly states that the State has a duty to inspect dams. Emergency action plans are not required under the law. Neither the statute nor the regulations discuss owner non-compliance/violations/penalties. Neither the statute nor the regulations discuss recordkeeping responsibilities.

Citation and Title
[Statute] Wisconsin's dam safety law is found in Wisconsin Statutes (W.S.) Chapter 31, "Regulation of Dams and Bridges Affecting Navigable Waters."


[Administrative Agency] Department of Natural Resources

Jurisdiction/Powers of Department
According to W.S. § 31.02, the Department of Natural Resources:
1) may regulate and control the level and flow of water in all navigable waters,
2) may investigate, determine and supervise the construction, operation, maintenance and equipment of dams in navigable waters, and all dams so constructed and operated shall be subject to the supervision of the Department and to the orders made or regulations promulgated under the statutory authority.
3) shall have access to all dams and appurtenant works and enter any property to investigate a waterway,
4) may order dams to be equipped and operated with certain features [see Chapter 31.02(4)],
5) shall give written notice to the public service commission of hearings involving public utilities,
6) shall operate and maintain dams across drainage ditches for conservation purposes, and
7) shall confer with the local officials of drainage districts on the formation of policy for the operation and maintenance of dams.

The Department also has the power to issue permits for construction, reconstruction, operation and maintenance, and abandonment of dams, to grant permission for the raising or enlarging of existing dams, require permit applicants to furnish proof of ability to operate and maintain the dam in good condition, conduct inspections upon complaint or at their discretion, order
alterations or reductions in water level, and to charge permit and approval fees. W.C. § 31.18 grants the Department the power to order the repair of any dam without notice or hearing in the event of an emergency.

Additionally, the Department must approve plans and specifications prior to the construction of a new dam or reconstruction of an existing dam, and must make preliminary determinations of hazard classifications, as well as final hazard, size and spillway capacity assignments. Other duties of the Department include approving or disapproving documented safety measures as required by W.A.C. NR 333.07(4), and ordering public hearings for permit applications. The department may also employ and fix the salaries of a competent hydraulic engineer and other assistants necessary to carry out the provision of this chapter. W.C. § 31.29.

**Liability and Immunity**

Dam owners are liable for damages to property resulting from failure to meet design requirements, and persons suffering such damages shall have a lien upon the dam and appurtenances of such owner. W.C. § 31.26. The law expressly protects the State from liability for such damages.

**Definitions/Dam Classifications**

*Dam* is defined in W.A.C. NR 333 as "any artificial barrier, together with appurtenant works, built across a waterway that has the primary purpose of impounding or diverting water". Jurisdiction for the dam inspection program described in W.A.C. NR 333, is established by defining *large dams* as those with 1) a structural height of 25 feet or more and that can impound more than 15 acre-feet of water or, 2) structural height of more than 6 feet and that can impound more than 50 acre-feet of water. *Structural height* is defined as the difference in elevation in feet between the point of lowest elevation of the dam before overtopping and the lowest elevation of the natural stream or lakebed at the downstream toe of the dam.

All *large dams* in the State, except those owned by the US Government or inspected, approved and licensed by a federal agency, are under Department of Natural Resources jurisdiction and must conform to Chapter NR 333 "Dam Design and Construction Standards". The Department assigns dam hazard ratings. In addition, the hydraulic, hydrologic and stability analysis (plans and specifications) required for approval to construct or reconstruct a dam, must include a hazard rating. W.A.C. NR 333.04-05.

W.A.C. NR 333.06 sets forth rules for determining the dam hazard classification using land use and land use control classifications for each dam. Land use and land use control classifications are assigned according to the type of development, structures and activities that exist within the downstream floodway, flood fringe and hydraulic shadow inundating land during failure of the dam, and how restricted (or controlled) future development is within the hydraulic shadow.

**Hazard Classification**

*Low Hazard*: A low hazard rating shall be assigned to those dams that have no development unrelated to allowable open space use in the hydraulic shadow where the failure or mis-operation of the dam would result in no probable loss of human life, low economic losses (losses principally limited to the owners property), low environmental damage, no significant disruption of lifeline facilities, and have land use controls in place to restrict future development in the hydraulic shadow.

*Significant Hazard*: A significant hazard rating shall be assigned to those dams that have no existing development in the hydraulic shadow that would be inundated to a depth greater than 2 feet and have land use controls in place to restrict future development in the hydraulic shadow. Potential for loss of human life during failure must be unlikely. Failure or mis-operation of the
A dam would result in no probable loss of human life but can cause economic loss, environmental damage, or disruption of lifeline facilities.

**High Hazard:** A high hazard rating shall be assigned to those dams that have existing development in the hydraulic shadow that will be inundated to a depth greater than 2 feet or do not have land use controls in place to restrict future development in the hydraulic shadow. This rating must be assigned if loss of human life during failure or mis-operation of the dam is probable.

In addition, all dams are classified according to size:
- **Minor dams** are those with structural height less than 15 feet and maximum storage capacity of less than 300 acre-feet.
- **Major dams** are those with structural height greater than 15 feet and maximum storage capacity greater than 300 acre-feet. The dam hazard rating and the size classifications are used to determine minimum principal and total spillway capacities for each dam as required under Chapter NR 333.07.

- **a. Abandonment:** The removal of a dam in compliance with W.C. § 31.
- **b. Engineer:** Not defined.
- **c. Hazard Potential:** Not defined.
- **d. Operator:** Not defined.
- **e. Owner:** Any individual, partnership, public utility, company, cooperative, trust, corporation, association, state or interstate agency, city, village, town, county or special purpose district such as a drainage district or a public inland lake protection and rehabilitation district which has title to or recorded easement for operation, maintenance and access to a dam or to the specific parcel of land on which a dam exists.
- **f. Person:** Not defined.
- **g. Repairs:** Work performed on a dam, including maintenance, which his required to provide proper operation or continued structural integrity of the dam and does not change the dam’s hydraulic capacity.
- **h. Spillway:** The primary structure for the discharge of normal flow through a dam.

**Program Funding**

W.A.C. NR 335 establishes a Dam Maintenance, Repair, Modification, Abandonment and Removal Aid Program:

Any municipality or lake district that owns a dam in Wisconsin may apply for State aid for repair, modification or abandonment of the dam. To be eligible, the owner shall request, in writing, financial assistance under this chapter within 6 months after receiving directives or an order for repair, modification or abandonment of the dam resulting from a department investigation or inspection of the dam.

The State share may not exceed 50% of the total eligible project costs nor exceed $200,000 for any one dam.

W.A.C. NR 335.06 sets forth application and award procedures. Applications are reviewed on a points system, the award going to the application with the highest points on a priority list. The priority list is comprised of the following criteria: (a) dam hazard rating; (b) adequate land use controls currently in effect or dam to be abandoned; (c) financial need; (d) total eligible project cost; (e) navigability; and (f) size of dam.

**Fees and Costs**

The Department shall charge a permit or approval fee for carrying out its duties and responsibilities. The permit or approval fee shall accompany the permit application or request for approval.
The Department shall classify the type of permits and approvals based on the estimated time spent by the Department in reviewing, investigating and making determinations whether to grant the permits or approvals.

The fees are as follows:
1. For a permit or approval with an estimated time of less than 3 hours, the fee shall be $30.
2. For a permit or approval with an estimated time of more than 3 hours but less than 9 hours, the fee shall be $100.
3. For a permit or approval with an estimated time of more than 9 hours, the fee shall be $300.

If the Department conducts a hearing on an application for which notice under § 31.06 was provided, the person requesting the hearing shall pay a fee of $25.

The Department shall refund a permit or approval fee if the applicant requests a refund before the Department determines that the application for the permit or approval is complete.

If the applicant applies for a permit or requests an approval after the project is begun or after it is completed, the department shall charge an amount equal to twice the amount of the fee that it would have charged.

If more than one fee is applicable, the Department shall charge the only the highest of the two fees.

**Permit/Approval Process**

Any person, firm, corporation or municipality desiring a permit to construct, operate and maintain a dam shall file with the department a written application. W.S. § 31.05.

Wisconsin regulations require the following for the approval of permits:

1) determination of preliminary dam hazard rating prior to granting of permission to construct or reconstruct a dam,
2) submission of plans and specifications, including hydraulic, hydrologic and stability analyses prepared by a professional engineer registered by the State of Wisconsin,
3) submission of estimated costs of the construction, reconstruction, or restoration project, and
4) documentation and approval of safety requirements, including an emergency action plan.

W.A.C. NR 333.07.

Details on these state standards, and procedural guidelines for compliance are provided in W.A.C. NR 333.

Dam owners planning to construct or reconstruct must file a bond with the Department equal to the estimated cost of restoring a reconstructed dam to a safe condition or the cost of constructing or reconstructing the dam, whichever is less. W.A.C. NR 333.09. Owners are also required to furnish proof of financial ability to operate and maintain the dam in good condition.

Information required for permit application is described in W.C. § 31.05. Upon receipt of an application, the Department may order a hearing, or may proceed without a hearing. If a hearing is ordered, the Department shall consider the ecological, aesthetic, economic and recreational value of the area with and without the dam before deciding to approve or deny the permit. W.C. § 31.06.

Persons desiring a permit to operate and maintain an existing dam must also file applications with the Department. Grantees of permits to construct, operate and maintain dams shall also file maps, profiles and plans with the Department for approval or modification. W.C. § 31.12. Owners wishing to raise or enlarge dam must apply to the Department for permission and shall furnish the information required. W.C. § 31.13.

W.C. § 31.09 describes proposals which are required to be filed with permit applications for those dams constructed for the purpose of developing or aiding in the development of power, or which are capable of developing a certain amount of power. Added restrictions apply to applicants filing for water power permits under W.C. § 31.095.
Chapter 31.185 sets forth procedures for application for permits to abandon or transfer ownership of dams. No owner of any dam may abandon or remove or alter the dam without first obtaining a permit from the Department. W.C. 31.185. The application shall include the owners name and address, a brief description of the dam and its location and other information, as the department requires for the purpose of enabling it to act on the application. The Department may remove or cause to be removed, in such manner as it deems fit, old and abandoned dams in streams in this state, upon giving 60 days notice in writing to the owner thereof, if the owner can be found. If the owner of the dam is unknown or cannot, by due diligence be found, the department shall publish a class 3 notice. W.S. § 31.187.

Inspection Process
[State] With the exception of federally inspected dams, Wisconsin law requires the Department to inspect each large dam in the state at least every ten years, upon receipt of a complaint, or at the discretion of the Department. If pursuant to an investigation, the department finds a dam to be unsafe, it may order the owner to make alterations or repairs within a certain time period, or it may order the water to be drawn off. W.C. § 31.19.
[Owner] The dam safety laws and regulations do not dictate what responsibility the owner of a dam has to inspect his/her dam.

Right of Entry
The dam safety laws and regulations do not explicitly mention right of entry.

Operation and Maintenance
Any person, firm, corporation or municipality desiring a permit to operate and maintain a dam constructed in or across navigable waters without legislative permission, shall file with the Department a written application. W.S. § 31.07. The owner of a dam shall maintain and operate all dams for the protection of public rights in such waters, and for the protection of life, health and property, in good repair and condition, and shall not willfully, or otherwise, injure, remove or destroy the same unless the Department approves removal or destruction in writing. W.C. § 31.18.

Emergencies/Emergency Action Plan
In the event of an emergency, the Department shall have the authority, pending investigation and hearing, to order the repair of any dam without notice and hearing. W.S. § 31.18.

Owner Non-Compliance/Violations/Penalties
The dam safety laws and regulations do not discuss owner non-compliance/violations/penalties.

Recordkeeping
Recordkeeping is discussed throughout the various sections of the dam safety laws and regulations.

Oversight
Prior to seeking or causing the removal of a dam under this chapter, the Department shall hold a public informational hearing on the proposed removal or publish a class 2 notice stating that it will seek or cause the removal of the dam without holding a public hearing unless a hearing is requested in writing within 30 days after the last publication of the notice. W.S. § 31.253.
Miscellaneous
1) Special provisions are made in Wisconsin law for mills and mill dams, dams on non-navigable streams, and dams constructed and operated by municipalities. (See Chapter 31.3138)
2) Wisconsin has a comprehensive floodplain management program. Municipalities are required by law to adopt floodplain zoning ordinances, and Department of Natural Resources regulation (Chapter NR 116) provides a uniform basis for the preparation and implementation of local floodplain programs. In addition, the consideration of floodplain restrictions, usage and control heavily influences dam design and construction standards required under Chapter NR 333. For example, plans and specifications must include calculations of regional flood flows, determination and delineation of the dam's hydraulic shadow, and determination of land use and land use control classifications. The Department also requires maps of a certain scale showing the land affected by the dam and its flowage before dam construction can begin.
3) The Department may remove or cause to be removed old and abandoned dams in streams, upon giving 60 days notice in writing to the owner. If the owner of the dam is unknown or cannot, by due diligence, be found, the department shall publish a class 3 notice in the county in which the dam is located. W.C. § 31.187. Prior to causing the removal of a dam, the department shall hold a public hearing on the proposed removal or publish a class 2 notice stating that it will cause the removal of the dam without holding a public hearing unless a hearing is requested in writing within 30 days after the last publication of the notice.
4) The owner of a dam shall file a bond, escrow account, lien or other financial assurance satisfactory to the department prior to the commencement of construction or reconstruction of the dam. The amount of such assurance shall equal the estimated cost of removing the dam and restoring the stream channel to its natural condition or the cost of constructing or reconstructing the dam, whichever is less, based on the cost estimate submitted by the owner. W.A.C. NR 333.09.
   a. Complaints to Unsafe Conditions
      - The dam safety laws do not specifically address complaints to unsafe conditions.
   b. Environmental Impact
      - The dam safety laws do not specifically address environmental impact.
   c. Severability
      - The dam safety laws do not specifically address severability.
   d. Supplemental Research Material
      - The dam safety laws do not specifically address supplemental research material.
**Wyoming**

**WYOMING**

**Summary**

[Pros] There are no provisions the Wyoming dam safety statute distinguishable for this section. [Cons] The statute does not discuss with specificity the permit application process. The statute does not include design requirements, hazard classifications, or a comprehensive “Definitions” section. Under the statute, inspections are the responsibility of the State Engineer. In addition, inspections are made at the State’s expense. The statute does not mention program funding or filing fees of any kind.

**Citation and Title**


[Rules/Regulations] According to the ASDSO website, the State Engineer's Office Regulations and Instructions; Part I, Surface Water, Chapter 5 were adopted in 1913, and last revised in 1974. After extensive research, however, the regulations could not be located.

[Administrative Agency] State Engineer’s Office.

**Jurisdiction/Powers of Department**

The dam safety program in Wyoming is the responsibility of the State Engineer, whose duties and powers are mentioned throughout W.S. §§ 41-3-307 through 41-3-318. They include the following: the power to approve or reject plans and specifications of proposed dams or diversion systems; the power to inspect personally or appoint an assistant engineer to inspect the construction, enlargement, repair, alteration or removal of any dam and to issue orders for the revision of plans or the stoppage of work; the power to carry out periodic inspections to insure the continued safety of dams, the power to order the draining or the limitation or cessation of dam's use if it is found to be unsafe; in the case of an emergency, the power to order necessary repairs or breaching, and the power to perform such acts if the owner fails to comply; the power to enforce and apply sections of the dam safety law to dams not within the size limitations of the definition of a dam but which is located in an area of occasional or permanent occupancy; and finally, the power to cancel water rights permits where the provision of the law have not been met.

**Liability and Immunity**

W.S. § 41-3-313 provides that the State Engineer or his staff shall not be held liable for any damages or loss of water resulting from the draining of a dam or imposed restrictions. W.S. § 41-3-316, provides that no action shall be brought against the State or its staff for the recovery of damages resulting from dam failure, and lists the functions of the State Engineer's office, which may not be used as grounds for such legal actions. Liability of reservoir owners is addressed in W.S. § 41-3-317, which states in part that nothing in the statutes shall relieve an owner of any legal obligations or liabilities incident to ownership or operation of a dam or damages resulting from the failure of a dam.

**Definitions/Dam Classifications**

W.S. § 41-3-307 defines the term dam as any artificial barrier, including appurtenant works, used to impound or divert water and which is or will be greater than twenty (20) feet in height with an impounding capacity of fifty (50) acre-feet or greater. Dams less than 15 acre-feet in capacity or 6 feet or less in height are excluded. No system of dam classification is provided for.
a. **Abandonment**: Not defined.
b. **Engineer**: Not defined.
c. **Hazard Potential**: Not defined.
d. **Operator**: Not defined.
e. **Owner**: Includes any of the following who own, control, operate, maintain, manage or propose to construct a dam or reservoir: the state and its departments, institutions, agencies and political subdivisions; every municipal or quasi-municipal corporation; every public utility; every district; every person; the federal government and its departments, institutions, agencies and political subdivisions; the duly authorized agents, lessees or trustees of any of the foregoing; and receivers or trustees appointed by any court for any of the foregoing.
f. **Person**: Any person, firm, association, organization, partnership, business trust, corporation or company.
g. **Repairs (Alteration)**: Only such alterations or repairs as may directly affect the safety of the dam or diversion system, as determined by the State Engineer or his designated representative.
h. **Spillway**: Not defined.

**Program Funding**
The dam safety statute does not address program funding.

**Fees and Costs**
The dam safety statute does not address filing fees.

**Permit/Approval Process**
Under W.S. § 41-3-308, plans and specifications for any proposed construction, enlargement, major repair, alteration or removal of a dam or diversion system shall be prepared by or under the direction of a registered professional engineer licensed to practice in the State of Wyoming. These plans and specifications must be submitted to the State Engineer for review and approval. No work shall begin until the submitted plans and specifications are approved by the State Engineer. Once the plans and specifications have been approved by the State Engineer, a qualified engineer shall be in charge of and responsible for the proposed work. The engineer in charge shall inspect the work and submit reports to the State Engineer's office detailing the information obtained during the inspection and on the progress of the work. W.S. § 41-3-309. If the State Engineer believes that inspections are inadequate or that additional inspections are necessary, the State Engineer may inspect personally or appoint an assistant engineer to inspect the construction, enlargement, repair, alteration or removal of any dam or diversion system. If after any inspection the State Engineer finds that amendments, modifications or changes are necessary in order to insure the security and integrity of the work and structure, the protection of property or the public safety, the State Engineer may order the owner or owners of the dam to revise plans and specifications, or order work stopped. W.S. § 41-3-310. Any inspections required by this section shall be made at State expense unless the State Engineer appoints an assistant who is not a regular employee of the State of Wyoming. In this case, the expenses of the inspection are borne by the owner.

**Inspection Process**
[State] The State Engineer shall inspect any dam subject to the terms of the dam safety statute, at least once every 10 years or as often as deemed necessary based on the hazards of the dam to insure the continued protection of public safety and property. W.S. § 41-3-311. Inspections shall be made at State expense.
Inspections made at the request of other parties are covered in W.S. § 41-3-312. Persons requesting that a dam be inspected may be asked to deposit a sum of money sufficient to cover the cost of the inspection into the State Engineer's holding account, and these funds will be used to pay for the investigation if the dam is found to be in a safe and usable condition. If the dam is found to be defective, the owner shall be liable for expenses, and the State Engineer may order the draining of the reservoir or the cessation of use of any of the works until the owner returns them to a safe condition. [Owner] The statute did not discuss an owner’s duty to inspect his/her dam.

Right of Entry
The State Engineer or his appointed representative shall have right of entry upon private or government lands.

Operation and Maintenance
Operation and maintenance is not addressed in the dam safety statute.

Emergencies/Emergency Action Plans
Emergency repairs and breaching are authorized in W.S. § 41-3-314. The State Engineer may declare an emergency and may order repair work or breaching, or may commence the same himself if the owner fails to do so. All costs incurred by the State Engineer during an emergency are payable by the owner. Emergency Action Plans are not included as part of the dam safety program in Wyoming.

Owner Non-Compliance/Violations/Penalties
W.S. § 41-3-318 provides that failure to comply with the provisions of the safety of dams statutes subjects the owner's water rights permit to cancellation and the owner to penalties up to $500.00 per day. The State Engineer may cancel any permit wherein the provisions of the law have not been or are not being complied with, and the owner thus forfeits all rights acquired under any permit approved by the State Engineer.

Recordkeeping
All information obtained as a result of the inspections shall be filed in the State Engineer’s office. W.S. § 41-3-311.

Oversight
W.S. § 41-3-318 provides for appeals from any decision of the State Engineer concerning the issuance of orders or the cancellation of permits. First appeals may be made to the board of control, and appeals from board decisions may be made to the district court.

Miscellaneous
Wyoming law requires that all dams be constructed to include an outlet controlled by a head gate or other control works. W.S. § 41-3-313 provides that all newly constructed dams contain such an outlet, and that any existing dams without an outlet or means of lowering the reservoir water level may be drained by breaching at the owner's expense when public safety so requires.

a. Complaints to Unsafe Conditions
   - The dam safety laws do not address complaints to unsafe conditions.

b. Environmental Impact
   - The dam safety laws do not address environmental impact.

c. Severability
   - The dam safety laws do not address severability.

d. Supplemental Reference Materials