

Association of State Dam Safety Officials

**Summary of State Laws and Regulations
on Dam Safety**

July 2000

Foreword

This publication is a compilation and summarization of the United States state laws and regulations pertaining to dam safety. Although laws and regulations vary from state to state, this document attempts to categorize the main functions of each state's policies and thus create a quick reference to specific issues.

This version is an update of the 1994 publication, and includes summaries for forty-nine states and Puerto Rico. (Alabama currently has no dam safety laws or regulations, though this may change soon.) Each state section contains the following categories: Citations, Definitions, Jurisdiction/Powers of Department, Permitting/Approval Process, Inspection Process, Owner Non-Compliance/Violations/Penalties, Emergencies, Liability, Oversight, and Miscellaneous. Appendices contain state citations and URLs for state dam safety program Web sites, many of which contain links to full-text versions of statutes and rules.

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ALABAMA

Alabama has no laws or regulations pertaining to dam safety. Proposals for future legislation are currently under consideration. An initial meeting of a task group was held in June 2000, and further meetings have been scheduled.

Citation

Laws pertaining to the Alaska dam safety program are found in Alaska Statutes AS Title 46 Chapter 17 effective May 31, 1987. Regulations are in AAC Chapter 93 Section 150.201 which were last amended August 16, 1989.

Definitions/Dams Classification

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" (AS 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 AAC 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 (11 AAC 93.157).

Jurisdiction/Powers of Department

The Department of Natural Resources supervises the safety of dams and reservoirs (AS 46.17.020). The department has the power to adopt regulations and issue orders necessary to carry out its duties (AS 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 (AS 46.17.040). The department has the power to make inspections (AS 46.17.050). The department may enter a dam or reservoir premises without notice if there is reason to believe that a dam or reservoir may be unsafe or presents an imminent threat to life or property (AS 46.17.060). The department may order the owner to take action to protect life and property if it determines the dam or reservoir is unsafe (AS 46.17.070) 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 AAC 93.163).

Permit/Approval Process

No person may abandon a dam, remove 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 AAC 05.010, and receiving a certificate of approval from the commissioner for the proposed action. 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" (11 AAC 93.170). The laws and regulations do not specify any spillway requirements or recommendations. Remedial work is to be paid for by the owner (11 AAC 93.163).

Inspection Process

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 AAC 93.159). The safety inspections must be performed by a state-approved engineer with sufficient experience in dam design, construction, and safety appropriate for the type of dam inspected. 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 AAC 93.159 has been inadequate, the commissioner may inspect the dam, at the owner's expense (11 AAC 93.161).

Owner's Non-Compliance/Violations/Penalties

The department has the authority to issue orders for remedial measures to be performed at the owner's expense (11 AAC 93.163). A person is guilty of a Class A misdemeanor if the person knowingly violates a provision of the laws or regulations (AS 46.17.150).

Emergencies

In an emergency situation the commissioner will, at the commissioner's discretion, take remedial action that the commissioner determines is necessary to protect life and property from the risks posed by the dam's operation or potential failure (11 AAC 93.163). The commissioner may take supervisory control of the dam from the owner, over the owner's objection if necessary, until the emergency passes (11 AAC 93.163). Emergency action plans are required for all Class I and II dams. (11 AAC 93.167 and 11 AAC 93.171).

Liability

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." (AS 46.17.120). State liability is addressed in the laws or regulations. (AS 46.17.110)

Oversight

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 (AS 46.17.110).

ARIZONA

Citation

The Arizona dam safety law is contained in Arizona Revised Statutes Title 45, Waters, Chapter 6, Dams and Reservoirs, Article I, Supervision of Dams, Reservoirs and Projects, ARS 45:1201-1223. The rules pertaining to the dam safety program are contained in the Arizona Rules and Regulations Pertaining to the Supervision of Dams, Chapter 15, R12-15-151 and 152-15-1201 through 1226. These rules and regulations were originally adopted on Nov. 2, 1978 and substantially revised in 2000.

Definitions/Dam Classification

Arizona Statutes Section 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 at 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

Hazard classification criteria are given in the Rules (R12-15-1206).

Category	Economic Loss
Very Low - Low	Minimal (underdeveloped to occasional structures or agriculture)
Significant	Appreciable (notable agriculture, industry, or other structure)
High	Excessive (extensive community, industry, agriculture), with probable loss of life

The size of each dam is defined according to the U.S. Army Corps of Engineers National Inventory of Dams standard.

Jurisdiction/Powers of Department

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.

Approval Process

Arizona law cites characteristics of the process to approve construction, reconstruction, repair, operation, maintenance, enlargement, removal, or alteration of a dam including what shall be included in the application process plus what should be in the plans and specifications and what other materials are required by the director. Rules R12-15-1207 describe the application process in detail--what should be in the application and how the filing fee is calculated. Rules R12-15-1215 describe what should be in the plans and specifications for construction, alteration, etc.

In these rules, it states that all plans and specifications accompanying an application for approval shall be prepared by or under the direction of a professional engineer, registered under Arizona law.

The law pertaining to repair specifies that the approval process may be waived if repair is needed immediately in order to safeguard life and property. The director must be informed prior to this action taking place.

Application Fees

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 established 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	.25 each
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Computer reports:

First page of report	\$15
Additional pages	.25 each

Certified "True Copies"	\$2.75/ Page
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Arizona

Approval of Application

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

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. Guidelines were developed to accompany the rules stating operation and maintenance frequency--they are as follows:

Hazard Potential	Storage Dam Inspection Frequency (at least once each)
Low – Very low	Five Years
Significant	Three Years
High	One Year

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.

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.

Emergencies

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 (Sect. 45-1212.01).

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.

Liability

Section 45-1215 of the law 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.

Oversight

Section 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

Financing

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.

ARKANSAS

Citation

Laws pertaining to the Arkansas dam safety program are found in Arkansas Code Annotated Section 15-22-201 through 15-22-222. Regulations are found in Rules and Regulations Governing the Arkansas Dam Safety Program adopted November 20, 1990.

Definitions/Dam Classification

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."

Classification

Sections 705.3 – 705.4 of the rules 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. Section 705.5 provides detail on the hydrologic criteria for dams (minimum flood hydrograph) based on hazard classification.

Category	Maximum Storage (ac-ft)	Height (Feet)
Small	50 to 1000	25-40
Intermediate	1000 and < 50,000	40 and < 100
Large	50,000	100

- *Low Hazard Dams* are those for which no loss of life and minimal economic loss are expected in the case of failure.
- *Significant Hazard Dams* are those for which loss of life is possible, but not expected, or for which economic loss would be appreciable.
- *High Hazard Dams* are those for which loss of life is expected, or for which economic damage would be excessive.

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. S.15-22-205);
- Require a permit for construction and operation of all dams which exceed 25 feet in height and impound at least 50 acre-feet of water except those owned by the US government (A.C.A. S.15-22-210 and S.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. S.15-22-214);
- Enter property at any time to inspect the dam or site before, during or after construction (A.C.A. S. 15-22-2);
- Direct dam owners to make repairs necessary to protect the safety of the dam (A.C.A. S.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. S.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. S.15-22-208).

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 (Rules Section 705.2)

A permit for construction is required prior to construction of any dam not exempted from commission authority. (Rules Section 702.1)

- 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. (Rules Section 702.2)
- Preliminary plans and hydrologic information must be submitted with the application for permit. (See Rules Section 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. (Rules Section 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. (Rules Sections 702.7 and 702.8, and A.C.A. S.15-22-206)

Inspection Process

The commission inspects dam sites prior to construction, during critical phases of construction, and after completion of construction. The commission also conducts annual inspections of high- and significant-hazard dams and inspects other dams less frequently. Owners are required to inspect their dams annually and after unusual events. (Rules Subtitle)

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. S.15-22-210[2])

Owner's 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. S.14-22-204 and Rules Subtitle IV)

Emergencies

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 Section 704.4 (Section 704.5 of Subtitle IV)

An emergency action plan must be prepared by the owner for all permitted high-hazard dams. Written approval of the Chief Engineer must be obtained for all EAPs. Site conditions will dictate exact contents of specific EAPs. Guidelines for preparation of EAPs available from the Commission. Implementation of EAPs must include at least one table-top 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. (Sections 710.1 – 710.4 of Subtitle X)

Liability

Owners' legal duties, obligations, and liabilities incident to ownership are not reduced by Commission rules. (Rules section 701.6)

No action shall be brought against the states 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 defendant is liable by virtue of any of the following:

1. The approval of the dam or reservoir or approval of flood-handling plans during construction
2. The issuance or enforcement of orders relative to maintenance and operation
3. Control and regulation of the dam or reservoir
4. Measures taken to protect against failure during an emergency (Rules section 701.7 and ACA 15-22-210[2])

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. (ACA S.15-22-209 and S.15-25-201)

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. (ACA D.15-22-210[1] and Rules Section 705.6)

CALIFORNIA

Citations

Laws pertaining to the California dam safety program were originally adopted in 1929 and are amended in the California Water Code Division 3, Section 6000-6501, last amended in 1995. Regulations are in California Administrative Code Title 23 Chapter 2, Articles 1-301 to Articles 5-333. Adopted 1986.

Definitions/Dam Classification

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. (CWC 1.6002 and 1.6003)

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. (4.1.6081)

Federal dams are excluded from state regulation.

Hazard classification criteria

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.

Jurisdiction/Powers of Department

The Legislature provides for the regulation and supervision of dams and reservoirs exclusively by the state. (CWC 4.2.6025) The Department of Water Resources, Division of Safety of Dams (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 (4.1.6075). It is unlawful to remove, maintain or operate any dam or reservoir except upon approval of the department provided in this part. (4.1.6077) 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. (4.1.6080)

California

The department shall employ staff and may hire consultants. It 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.

The department may revoke a permit after public hearing.

The department shall employ whatever remedial means necessary to protect life and property in the event of an emergency or threat of an emergency. (4.1.6001)

Permit/Approval Process

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, (5.1.6200) with a separate application filed for each dam and reservoir. (5.1.6201) The application shall be accompanied by maps, plans, and specs containing pertinent details and dimensions as the department requires. (5.1.6206) (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 law states that an application must include information required by the California Environmental Quality Act and must satisfy water rights procedures. All plans and specifications must be drawn by a registered professional engineer<197>the law spells out what these construction records should include. After the application is approved, a certificate of approval is issued.

Application fees for permitting are based on the cost of the project and are as follows:

Cost	Fee
First \$300,000	3%
Next \$700,000	2%
Next \$1,000,000	1.5%
Next \$1,000,000	1.25%
Next \$2,000,000	1%
Next \$2,000,000	0.75%
Over \$7,000,000	0.50%

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.

The law does not set standards for design and construction but the state furnishes the "Guidelines for Design and Construction of Dams in California."

Inspection Process

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. 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 whether or not the plans are being followed. (7.6.6400) The owner must inform the department when any unusual circumstances or unprecedented flooding occurs.

The state inspects annually but more or less frequently as needed on a case-by-case basis.

No inspection fees are charged since the law requires inspections at state expense.

Owner's 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. (4.5.6150) The law lists the possible violations, which may be punishable. According to the law, a violator is guilty of a misdemeanor and is fined not more than \$2,000 or is imprisoned no more than 6 months, or both. Each day of violation constitutes a separate offense.

Emergencies

The department in emergency situations may (a) lower water level (b) completely empty reservoir or (c) take other necessary steps to ensure safety. (4.3.6111) The department shall continue in full control until the dam or reservoir is rendered safe or emergency situation is past. (4.3.6112) Any cost or expenses incurred in the remedial means provided in this article shall be recovered from the owner. (4.3.6113)

The law lists several types of emergency conditions.

Liability

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. (2.6028)

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. (2.6029)

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. (2.6031) 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 a reservoir storage less than 2,000 acre-feet.

There are many additional items in the California law, some important provisions follow:

1. The law gives the state authority to construct and maintain state-owned facilities and puts these structures under the same regulation as privately owned structures. An independent review board is established in the law to inspect state-owned dams.
2. The law gives instruction on how to file with the Fish and Game Commission when it is necessary.
3. The regulations instruct applicants on giving evidence of water rights compliance.
4. The law mentions that cities may regulate non-jurisdictional dams.
5. Throughout the law, exceptions are made for dams built before the original dam safety law was enacted.

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.

COLORADO

Citation

Colorado's dam safety law is contained in Colorado Revised Statutes Article 87, Reservoirs, enacted in 1899, and last amended in 1990. Regulations are found in Rules and Regulations for Dam Safety and Dam Construction (Rules), a Sept. 1988 publication of the Colorado Office of the State Engineer.

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." Dams falling under the jurisdiction of the State Engineer's Office program of dam safety are described in 37-87-105 C.R.S. (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 Rule 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 Rule 4 for more details)

Jurisdiction/Powers of Department

Section 37-87-105 C.R.S. 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 Article 87 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. Section 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.

Permit/Approval Process

Section 37-87-105 C.R.S. 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.

Rule 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 fee of \$3.00 per \$1000 or fraction thereof of the cost estimate, with a minimum of \$100.00 and a maximum of \$3000.00.

*(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 37-87-102 (2) and (3)).

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

According to Rule 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.

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. (See Rule 7.A.(2) and (3) for details.)

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. (See Rule 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 Rules 9.B through 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 Rule 10, and include As-Constructed plans, filling schedules and rates, instrumentation monitoring plan, and an Emergency Preparedness Plan.

Rules 11 and 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.

Inspection Process

Sections 37-87-107 to 37-87-114 of Colorado Revised Statutes 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. Costs incurred by the state engineer in rectifying such a violation may be recovered in civil litigation. 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 Rules 13, 14, and 15. Rule 13 deals with the determination of and compliance with the safe storage level of a reservoir. Rule 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 Rule 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.

Rule 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.

Owner Non-Compliance/Violations/Penalties

Section 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.

Emergencies

Owners of Class I and II dams are required to prepare, maintain and exercise Emergency Preparedness Plans in accordance with the requirements described in Rule 16. Section 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.

Liability

According to Section 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.

Section 37-87-104 specifically exempts dam or reservoir owners from liability in the case of overflow or failure unless such failure is the 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, Section 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.

Oversight

Under Section 37-87-112, owners may initiate complaints regarding actions taken by the state engineer (authorized under Sections 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

Section 37-87-114.5 and 37-87-122 C.R.S. and Rule 18 list the types of structures exempt from the provisions of the law and regulations. These include: mill tailings impoundments, siltation structures, livestock water tanks, and erosion control dams, and reservoirs which store water below the natural ground.

Section 37-87-124 C.R.S. and Rule 19 describe restrictions as to the construction, enlarging, or modification of recreational facilities within reservoirs.

Additional Publications:

Dam Safety Manual (January 1988)

Guide to Construction and Operation of Dams in Colorado (January 1999)

Model for Preparing a Dam Safety Emergency Preparedness Plan (April 1997)

Dam Safety Project Review Guide (Second Revision, May 16, 1996)

CONNECTICUT

Citation

Dam safety laws are found in Connecticut General Statutes (CGS), Sections 22a-401 through 411. Regulations are found in State of Connecticut Regulations 22a-409-1 through 409-2, Amended Nov., 1985, (Dam Safety Inspection Regulations)

Definitions/Dam Classification

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.

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

The regulations state that any dam can be reclassified at any time. Guidelines on hazard reclassification are contained in the regulations.

Jurisdiction/Powers of Department

The Commissioner for Environmental Protection (commissioner) has the authority to regulate the safety of dams. He 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. (CGS Sec. 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.

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. (CGS Sec. 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.

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

Height (in feet)	Fee
Between 5 and 15	\$25
Between 15 and 25	\$50
Greater than 25	\$100

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

Inspection Process

State

The commissioner 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.

Hazard Class	Inspection Frequency
Class A (low)	10 years
Class BB (moderate)	7 years
Class B (significant)	5 years
Class C (high)	2 years

The commissioner is required by regulation to inform the owner before at least 90 days before an inspection takes place and must furnish the owner with the inspection report upon completion.

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.

Connecticut

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 30 days of the date of the inspection to the Dam Safety Program. The inspection report shall be sealed by a professional engineer registered in the State of Connecticut. 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)

Owner's 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. (Sec. 22a-407)

The commissioner has the right to ask the attorney general to take action when necessary.

Emergencies

High and significant hazard dams must have an Emergency Operations Plan (EOP), which is tailored to reflect the dam's particular features and conditions. The E.O.P. 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)

Liability

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. (CGS Sec. 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).

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 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.

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 (CGS Sec. 25-76) 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.

DELAWARE

Citation

The law concerning dam construction in Delaware is very limited. It describes the process for building on unnavigable streams, the procedures for condemning materials for building and repairing dams, rights of entry to repair banks of streams, and penalties for injuries to adjoining lands caused by dams. These provisions are contained in Del. C. 23, Ch. 19 1901-1904. It is unclear when this law was adopted or amended. The state is currently considering adoption of new dam safety laws and regulations.

Definitions/Dams Classification

A *dam* is not defined in the provisions except to single out those structures erected as millpond dams. A dam cannot be erected to the injury of any mill lawfully existing above it upon the same stream, nor to the injury of any mill site above it on the same stream, where the fall is more than 3 feet upon the lands of any 1 person lying on or upon the stream, above the land of the person who makes the application for the building or raising of a dam, nor unless the person applying shall be the owner of the land where the abutment of the dam is built on 1 side of the stream.

Jurisdiction/Powers of Department

There is no provision in the law for state jurisdiction over dam safety.

The law states that the Superior Court within each county shall have jurisdiction on all applications to authorize the building or raising of any dam in such county.

The Court can make persons applying for order to raise or build a dam pay all expenses arising from the order, including the damages assessed to adjoining landowners. When these payments have been made or refused, the process of building or raising the dam can begin.

Permit/Approval Process

The only provisions stated in the law refer to carrying out the authorization of building or raising a dam. The law states that an applicant must petition the Superior Court upon 14 days notice, in writing, to all persons owning or holding land that will be affected by raising or building a dam. Such notice shall be served upon persons residing in the county personally, or by leaving a copy at their dwelling house, and persons residing out the county by a copy sent to their address by mail. The Court shall, by order, appoint 5 disinterested and substantial freeholders of the county as commissioners, directing them to go upon and view the premises embraced within the application for authority to raise or erect any dam.

The law goes on to specify what the commissioners are empowered to do. They may, after viewing the premises, determine the maximum height an applicant may build or raise the dam and assess the full value of damages that each owner of the lands may sustain by reason of the erection or raising of such dam, taking into consideration the benefit as well as the damages accruing to such owners. These determinations must be sent to the Superior Court in writing.

The commissioners may employ, by law, a surveyor or civil engineer to go upon the premises with them. The commissioners or civil engineer shall be paid the sum of \$2 per day they are employed under each order.

Inspection Process

There is nothing in law spelling out an inspection provision.

Owner's Non-Compliance/Violations/Penalties

The law specifically states that dam owners shall be liable for the flooding of other landowners' properties if flooding is caused by the dam. If this violation occurs, upon the complaint of the landowner injured or damaged, the dam owner shall be fined not more the \$10 per day the violation continues. Whoever offends shall also be liable for pecuniary damages to the landowner injured to be recovered in an action at law. (This law is only applicable to Kent and Sussex Counties.)

Oversight

Owners of land affected by raising or building a dam who are dissatisfied with the damages assessed him by the commissioners, can apply within 6 days after the determination for an order or review. The Court shall grant such order and appoint 5 new suitable persons to review the premises and reassess the damages to the lands of such persons as join in application for a review and which are or will be damaged by the raising or building of the dam. If no greater damages are allowed to owners of such land than were given in the first order, the owners shall not receive any larger sum than is assessed by the commissioners appointed on the order of review.

Miscellaneous

Procedure to Condemn Materials for Building and Repair of Dams

Section 1902 explains how a person may go about collecting materials from surrounding property for building or repair of his dam. The person must file a petition with the Court with 10 days notice to the landowner where such materials lie. The Court will appoint 5 commissioners (with the same requirements aforementioned) to go on premises and assess the value of such materials and damages to the owner of taking the same. The written determination shall be filed with the county clerk. The dam builder shall pay these assessed damages to the materials owner and shall be granted permission to enter that landowner's property to take the materials.

The owner of the materials shall have the latitude to file petition if he is not satisfied with the judgement and the Court shall appoint 5 new commissioners to review the case. These proceedings cannot delay the dam builder from taking the materials and proceeding with construction.

Citation

Statutes regarding the Florida dam safety program are found in F.S. 1989, Chapter 373 Part IV, Sections 373.403 through 373.4596 which is entitled, "Management and Storage of Surface Waters". Rules and regulations are cited in section 1741.01 (last amended May 1983).

Definitions/Dam Classification

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 in 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.

Jurisdiction/Powers of Department

The Department of Environmental Regulation is responsible for the dam safety program (373.019). "Water management districts" are also established to regulate dams (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 (373.413) and for maintenance or operation of dams (373.416). The department has the power to revoke a permit if it determines that a structure is a danger to the community. (Section 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 (373.423) and may not be refused immediate entry or access to carry out said inspections of permitted dams (373.425). The department may adopt rules as are necessary to carry out the provisions of the law. (Section 373.418) The department may order any necessary remedial measures, which are paid for by the owner (373.436). Finally, the department may employ any remedial means to protect life and property during emergencies (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.

Permit/Approval Process

A person proposing to construct or alter a dam, impoundment, reservoir appurtenant work, or works must apply for a permit from the department (Law 373.413). A written notice of the proposed action must be filed with the department at least ninety days before the start of any such action. The department will respond within 30 days (Rule 1741.07). Permit procedures are spelled out in the law (Section 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 (Law 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 (373.439).

Finally, the department required a permit for abandonment of dams. Any abandoned structure not claimed for three years becomes the property of the state. (Section 373.426)

Inspection Process

State

During the construction or alteration of any darn, impoundment, reservoir or appurtenant works, the department shall make at its expense periodic inspections annually, or as it deems necessary to ensure conformity with the approved plans and specifications included in the permit (373.423). Upon completion of the work, the department shall have periodic inspections made of permitted dams to protect public health and safety (373.425).

Owner

Monitoring or inspection devices may be required by the Department for use by inspectors or owners during or after completion of the permitted work. The department may also require that such monitoring or inspection devices, be read and documented at specified intervals and that copies of the information gathered be forwarded to the Department (Rule 1741.11). The owner shall make periodic inspections annually, or more frequently as deemed necessary. The inspections shall be performed by an engineer or his qualified representative (Rule 1741.15).

Owner's NonCompliance/Violations/Penalties

The department has the power to order for remedial measures be taken at the owner's expense (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 (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 (373.433).

Section 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.

Emergencies

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 FS 373.439. FS 252 is the "Emergency Management Act", which established each department head as the emergency coordination officer, with duties defined in FS 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.

Liability

No action shall be brought against 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 (373.450).

Oversight

A 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 (373.436).

Penalties and fines are covered in 403.121FS, and are for release onto adjacent property or waters of the state without a permit or in violation of a permit. Fines are limited by the penalty matrix according to this statute, but damages are absolute and a matter of strict liability. FS 861.03 makes it a second degree felony punishable by up to 15 years in jail and a \$10,000 fine in the event of willful and intentional uncontrolled release. Releases are allowed within the confines of the owner's property.

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.

GEORGIA

Citation

Laws governing the Georgia dam safety program are embodied in the "Georgia Safe Dams Act of 1978", (O.C.G.A. 12-5-370 through 12-5-385) last amended in 1990. Rules are found in Chapter 391-3-8 of the Rules of the Department of Natural Resources Environmental Protection Division, last amended in 1998.

Definitions/Dam Classification

Definitions are found in O.C.G.A. (Code Section) 12-5-372A, and in Section 391-3-8-.02 of the Rules. 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 Rules Section 391-3-8-.04)

Dams classifications are found in Code Section 12-5-375(a) and in Section 391-3-8-.03 of the Rules. 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."

Jurisdiction/Powers of Department:

Code Section 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 Code Section 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. Various sections of the statutes address the Director's powers to approve or disapprove applications for construction permits (Code 12-5-376), classify or reclassify dams into hazard categories, revoke, suspend, or modify permits, (Code 12-5-376(j)), issue administrative orders requiring owners to undertake maintenance and repairs deemed necessary at the owner's expense (Code 12-5-378), and to approve or disapprove applications for the removal of a dam (12-5-377). Code Section 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.

Permit/Approval Process

Code Section 12-5-376 provides that persons wishing to construct or operate a Category I dam must obtain a permit from the Division. The Director may require the submission of plans and specifications and other information as he deems relevant to the application. 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. Sections 391-3-8-.05 through 391-3-8-.09 of the Rules 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 Section 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. Filing fees or bonds are not required as part of either process.

Code Section 12-5-376.1 sub classifies Category I dams into size classifications and describes minimum spillway design requirements for each:

Small dams	25% PMP
Medium dams	33.3% PMP
Large dams	50% PMP
Very Large dams	100% PMP

Size classifications are defined in Code Section 12-5-376.1.

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 Code Section 12-5-378. No inspection schedules or fees for state inspections are provided for in the laws or regulations.

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 Code Section 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.

Rules Section 391-3-8-.10 states that dam owners are responsible for conducting routine inspections and maintenance of dams, and must report symptoms of dam failure to the Director. The frequency of such owner inspections is not specified.

Owner's 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. (Code Section 12-5-378) The Director is also authorized under 12-5-376 to revoke or suspend permits if dams are found to be in violation of permit conditions, the dam safety law or rules. Criminal (misdemeanor) and civil penalties for violations are listed in Code Section 12-5-385.

Emergencies

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. (Code 12-5-378(b)) Emergency Action Plans are not required under Georgia law or regulations.

Liability

O.C.G.A. 12-5-383 addresses the sovereign immunity of the state, the board, and the division, stating "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 Code Section 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."

Oversight

Owners who are aggrieved or adversely affected by an order of the Director shall be entitled to administrative and judicial review conducted in accordance with Code Section 12-2-2.

Miscellaneous

1. Code Section 12-5-375 requires the Director to conduct and maintain a state dam inventory of all jurisdictional dams. The original inventory was to have been completed by July 1, 1983, with follow-up inventories every five years after that time. The Director is authorized to contact federal and state agencies, including the US Army Corps of Engineers, and private entities for assistance and information.
2. Code Section 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.
3. Georgia dam safety rules provide specific, detailed permit application procedures and design standards for dams. The permit application procedures include requirements for a significant amount of technical information regarding the dam, its location, and design, and construction elements.

Citation

Rules are found in the Hawaii Administrative Rules Title 13 Sub-Title 7 Chapter 190-1 through 190-42 adopted in May 1990. Laws are contained in HRS S.179D, the Hawaii Dam Safety Act of 1987.

Definitions/Dam Classification

Dam is defined in both the law and the rules as "any artificial barrier, including appurtenant works, which impounds or diverts water, and which: (1) 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 a maximum water storage elevation, or (2) has an impounding capacity at maximum water storage elevation of fifty acre-feet or more. The rules do not apply to any artificial barrier which is less than six feet in height regardless of storage capacity or which has a storage capacity at maximum water storage elevation less than fifteen acre-feet regardless of height. Other exempt structures cited include those designed and constructed before June 6, 1987, although the maintenance, enlargement, alteration, repair, or removal of these dams is under authority of these laws (HRS 179D-5(b)). The rules detail other minor structures that are exempt from these chapters.

Rules S.13-190-2 also defines hazard categories in the following way:

- *High Hazard* - means failure would most probably result in the loss of lives and extensive property damage.
- *Moderate Hazard* - means failure would possibly result in the loss of life and appreciable property damage.
- *Low Hazard* - means failure would result in only minimal property damage.

Jurisdiction/Powers of Department

The entity with responsibility is the Board of Land and Natural Resources. The Board has the following powers authorized by law (HRS S.179D-6):

1. Establish rules and regulations to carry out the provisions of this chapter.
2. Conduct investigations and collect of data to properly ascertain features of the design, construction, repair, removal, and enlargement of dams. May require submittal of investigative reports from owners.
3. Conduct investigations and require reports from owners regarding stream run-off.
4. Authorized to enter upon private property where a dam is located as may be necessary in making investigations or inspections required or authorized by law.
5. Approval or revocation of plans and specifications for the construction of new dams or the enlargement of a dam; approval or revocation of separate applications to repair, alter or remove a dam. This does not apply to routine maintenance repairs.
6. Establishment of filing fees for applicants.

The rules go on to give the Board authority to cite owner non-compliance and to order necessary remedial work (13-190-41). The Board is also empowered by regulation to declare an emergency at the dam and order necessary action or take action necessary to alleviate the emergency (12-190-30). The rules go on to give the Board the authority to order the dismantling of work if it finds non-compliance to approved plans and specifications.

Permit/Approval Process

It is unlawful to construct, operate, or remove a dam without written approval by the Board. (179D-5). Before commencing the repair, alteration to appurtenant works, or removal of a dam or reservoir, the owner must file an application for the work and secure the written approval of the Board.

The regulations explain in detail the application process and what items it requires, including what is required upon completion of construction. They go on to detail the approval or revocation considerations that must be made by the Board (13-190-20, 23, 31).

A registered professional engineer is required to be in charge of and submit all plans and specifications for the initial construction, enlargement, alteration, repair or removal of dams and for supervision of construction (13-190-22).

A non-refundable application fee of \$25.00 is required for construction or enlargement (13-190-21). A separate application and filing fee (\$25) for the repair, alteration, or removal of a dam is required. Instructions for these processes are detailed in the regulations.

Spillway design criteria are not stated in the rules. A bond requirement to secure the financing of a project is not mentioned in the laws or regulations.

Inspection Process

Owner

During the construction, enlargement, repair, alteration or removal of any dam or reservoir, the owner must perform, at his own expense, work or tests necessary to insure proper compliance with the approved plans and specifications; provide adequate supervision by an engineer during construction; and provide any information requested by the board to determine that conformity with the approved plans and specifications is being achieved (Rules 13-190-30). The regulations also state that the owner is responsible for operation and maintenance of the dam and for periodic inspections during its operation. He must keep written records of the operation of the dam. He is required to notify the Board of any emergency situation or potential emergency affecting the dam's performance. (Rules 13-190-40)

All operational and maintenance costs are the responsibility of the owner. (13-190-40)

State

The Board may make periodic inspections, at the state's expense, for the purpose of ascertaining compliance with the approved plans and specifications (13-190-30). The Board is required to perform safety inspections every 5 years, and may require the owner to compile information needed for the inspection and fee structure as stated in the rules. Operation and maintenance inspections are the responsibility of the owner, though the Board can make inspections, at the state's expense, during this time also (13-190-40).

The regulations explain the complaint of unsafe conditions process giving the Board authority to hear complaints, conduct inspections relating to complaints, and make final judgment on the validity of the complaint. The Board may order remedial action pursuant to the acknowledgment of the complaint. (Rules 13-190-34)

Hawaii is in the process of formulating a more detailed dam inspection program.

Owner Non-Compliance/Violations/Penalties

If the owner fails to comply with the approved plans and specifications the board shall take action to revoke its approval and compel the owner to remove the incomplete structure sufficiently to eliminate any safety hazard to life or property (13-190-30). Any person who violates the rules or laws shall be liable for a civil penalty not to exceed \$500 for each day during which said violation continues (HRS 179D-8 and Rule 13-190-4).

Emergencies

In case of an emergency where the board declares that repairs, breaching of the dam, or other actions are immediately necessary to safeguard life and property, the work shall be initiated by the owner or by the board through its authorized agent at the owner's expense, if the owner fails to do so. The board shall be notified at once of any emergency repairs or other work instituted by the owner (13-190-41). The state requires the owner to prepare, maintain and implement an emergency preparedness plan for each dam. The minimum requirements are state in the rules. Annual updates are required as necessary (13-190-42).

The rules also list authorized emergency actions owners can take without permission of the Board.

Liability

The law states that the State, Board, Department, or its offices or employees are not liable for the recovery of damages caused by action or failure to act.

This chapter gives legal duties, obligations, and liabilities of dam ownership to the dam owner. Owners are not responsible for damage resulting from natural causes such as earthquakes, hurricanes, or extraordinary rains, which are defined (HRS 179D-4).

Oversight

Any person aggrieved or adversely affected by an order or action of the board is entitled to administrative and judicial review in accordance with Chapter 91, L 1987, c. 199, pt of citation 1 (HRS 179D-7 and Rule 13-190-5).

IDAHO

Citations

Rules are found in Idaho Safety of Dams Rules and Regulations (amended July 1988) which implement the provisions of the Safety of Dams Statutes, Title 42, Chapter 17, Idaho Code, as amended.

Rules and Regulations were first adopted in 1969 and last revised in July 1988.

Definitions/Dam Classification

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 habitans 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.

Jurisdiction/Powers of Department

The entity with jurisdiction is the Idaho Department of Water Resources and the Director of the Department of Water Resources (Rule 1,1,2). The law gives authority to the Idaho Water Resources Board to adopt rules and regulations. (I.C. 42-1714).

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. Application fees are established by a schedule based on storage or increases in storage capacity of the reservoir. 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.

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. The Statutes provide for inspections by the Department during the course of construction and suspension of work if construction does not conform. Project facilities 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).

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

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. (I.C. 421717). The Statutes do not provide for an inspection fee.

Owner

Owner's 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) Information needed by the Director sometimes requires work by professional engineers, but law does not require this.

Owner Noncompliance/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 corrective action to rectify the problem. 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. Violators of the laws or regulations are guilty of a misdemeanor. Each day constitutes a separate offense (Law 42-1720). The Statutes do not specify fines for violations.

Emergencies

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).

Liability

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. 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 (Law 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 section 42-1701A(4) of the Idaho code.

Citation

The Illinois dam safety law is contained in Illinois Compiled Statutes (615ILCS5), originally enacted June 10, 1911, and last amended February 7, 1996. 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.

Definitions

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." (Section 3702.20)

Dam height is defined by regulation as 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.

Dams are categorized according to the degree of threat to life and property in case of failure. *Class I dams* are those for which failure has a high probability of causing loss of life or substantial economic loss, similar to that of US Army Corps of Engineers High Hazard Potential or USDA Natural Resources Conservation Service Class (c) dams. *Class II dams* are those for which failure has a moderate probability for causing loss of life or substantial economic loss, similar to USCOE Significant Hazard Potential or USDA/NRCS Class (b) dams. *Class III dams* are those for which failure has a low probability for causing loss of life or substantial economic loss, similar to the USCOE Low Hazard Potential or USDA/NRCS Class (a) dams. In addition, dams in Illinois are categorized according to size in the following manner:

Category	Capacity (acre-feet)	Height (feet)
Small	less than 1000	less than 40
Intermediate	1000 to 50,000	40 to 100
Large	more than 50,000	more than 100

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.

Jurisdiction/Power of Department

The Department of Natural Resources 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, orders for alteration of a dam may not be issued by the Department until after notice and opportunity for public hearing have taken place.

Permit/Approval Process

Permit Application

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 Sections 3702.60 and 3702.70. 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.

There are no filing fees established by law for receiving a permit.

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 Section 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 (rules) 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 (Sect. 3702.40) and generally follow the U.S. Corps of Engineers' guidelines.

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.

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 ILCS 5/26a. They are not exclusive to the dam safety program.

Emergencies

In emergency situations, the Department is to follow procedures as outlined in Section 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.

Liability

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 ILCS 5/23a).

Oversight

Hearing Procedures

Procedures for permit, enforcement, classification, spillway design variation and non-compliance hearings are set out in Section 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

Financing

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.

Citation

Indiana's dam safety laws are contained in Indiana Code Chapters 14-27-7 and 14-28-1, originally enacted in 1945, and last amended in 1995. Although authorized by law, no separate body of administrative rules or regulations have been promulgated pertaining to the state dam safety program.

Definitions

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.

Indiana state law does not provide for hazard classification criteria for dams.

Jurisdiction/Powers of Department

The Indiana Natural Resources 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. The provisions of 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.

Permit/Approval Process

I.C. 14-28-1-22 requires a permit from the commission 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

The Indiana department of natural resources is required under the provisions of I.C. 14-27-7-4 to make engineering inspections of all dams at least once every two years, (or more frequently depending on the circumstances of the case), and upon the written request of any affected person or agency. The department files an inspection report and provides a copy, with suggestions for improvement when necessary, 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.

No inspection fees are assessed by the state, and requirements regarding the frequency or scope of owner inspections are not listed in the statutes. Information is provided however, in the department publication "Recommendations for Maintenance and Repair of Earthfill Dams and Appurtenant Works" (DNR Circular No. 9, 1966)

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 or the department commits a Class B infraction, and every day of failure constitutes a separate offense. The commission is authorized under 14-28-1-35 to maintain an action to enjoin any violation of the Flood Control chapter.

Emergencies

Emergency measures are addressed in I.C. 14-27-7-5. 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.

Liability

According to the provisions of I.C. 14-27-7-8, the natural resources 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.

Oversight

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

Miscellaneous

1. Indiana does not have a body of administrative regulations pertaining to dam safety, but the department of natural resources provides designers, owners, operators with important information and state guidelines in circular publications, "Recommendations for Maintenance and Repair of Earthfill Dams and Appurtenant Works" (DNR Circular No. 9, 1966), and "Building A Pond" (No pub. date available)
2. The commission is authorized under the provisions of I.C. 14-28-1-13 to construct flood control works and to procure and obtain flood control works in cooperation with federal agencies, local governing bodies, and private rural landowners.

Citation

Iowa's dam safety law is contained in Chapter 455B, Division III (Water Quality), Part 4 (Water Allocation and Use), first enacted in 1949, and last amended in 1986. Regulations are in Chapters 70-75 of the Iowa Administrative Code, Title V, Flood Plain Development. The regulations were enacted in 1975, and last amended in 1994.

Definitions/Dam Classification

IAC Chapter 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 Chapter 71 of the regulations, Section 567-71.3. 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 3) 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 a), b), or d) 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 567-71.3 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 567-72.3(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* - Structures located in 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.

Jurisdiction/Powers of Department

The Iowa Department of Natural Resources is responsible for the water resource programs in the state and has jurisdiction over all flood plains and floodways. Section 455B.262-263 of the Iowa Code includes the

declaration of policy and the duties of the Department in this regard. In addition, 567-70.1 of the regulations describes the scope of title of the Department, giving it the authority to “implement a program for the protection of life and property from floods and to promote the orderly development and wise use of the flood plains of the state” Along with these broad powers, the Department is authorized in Section 455B.264 to grant or deny permits upon application for the construction or maintenance of dams.

Other responsibilities of the Department are listed in Sections 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.

Section 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. Right of entry is specifically authorized in Section 567-73.25 of the regulations as part of the dam safety inspection program.

The power to promulgate rules and regulations is granted to the Department in Iowa Code 455B.278.

Permitting/Approval Process

Section 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. Several sections of regulations deal with the permitting process and related requirements. Section 567-70.3 & 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.

Section 567-70.5 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 Section 567-72.3, 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, Section 567-72.3 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 Sections 567-73.2 and 73.11.

Inspection Process

State

The dam safety inspection program is described in Section 567-73.20 through 73.26 of the regulations. 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. Inspection reports are prepared by 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. All major structures are inspected by agency personnel 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.

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. Construction must also be inspected by a registered engineer, 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 Section 73.21 of the regulations. Special inspections can be made by department personnel upon notice of the events or conditions listed in Section 567-73.23.

Owner Non-Compliance/Violations/Penalties

Chapter 455B.275(4)(5) of the Iowa Code 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. Section 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 dollars for each day that the violation occurs.

Emergencies

Iowa Administrative Code Sections 567-73.30 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.

Liability

One of the conditions for department approval of an activity or project listed in Section 567-72.30 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".

Oversight

Section 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. Section 567-70.6 of the regulations 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. Sections 567-72.50 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 (567-75.1). 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 Iowa Code Section 455B.275, the section of the Iowa Code which gives the Department regulatory authority over all other types of floodplain development, including non-milldams.

Citations

Kansas dam safety laws are found in KSA 82a-301 - 305a, last amended 1978. Regulations are found in Kansas Division of Water Resources Regulations KAR 5-40-1--5-40-9, effective May 1983, and last amended May 1, 1987. 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.

Definitions/Dam Classifications

A *dam* is "any artificial barrier, together with appurtenant works, which does or may impound water" (KAR 5-40-1). According to KAR 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.

Jurisdiction/Powers of Department

The Chief Engineer of the Division of Water Resources, 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. 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 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. (KSA 82a-303a) The statutes 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.

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. All plans and specifications for dams shall be designed by a licensed professional engineer, competent in dam design and construction. These plans and specifications are to be submitted to the Chief Engineer for approval.

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.

There is no fee schedule for applying for a permit in the laws or regulations.

Inspection Process

By law, the Chief Engineer shall have the power and is shall be his or her duty to inspect any dam or other water obstruction. The statutes do not however, specify a schedule or frequency of inspections by Division staff. Costs for any work required by the chief engineer prior to or as a result of an inspection shall be paid by the owner.

Regulations of the Division (KAR 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.

Owner Non-Compliance/Violations/Penalties

KSA 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.

Emergencies

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. (KSA 82a-303c[b])

Regulations (KAR 5-40-2k) require each application for a permit to construct a high hazard dam to include an emergency action plan.

Liability

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

Oversight

The Act for Judicial Review and Civil Enforcement of Agency Actions, KSA 77-601 through 627, provides for appeal procedures of chief engineer decisions through court action.

Miscellaneous

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

Citation

Kentucky's water resources law is contained in Kentucky Revised Statutes Chapter 151, Geology and Water Resources. Originally enacted in 1966, the law was last amended in 1990. Regulations relating to dam safety are in Kentucky Administrative Regulations Chapter 4, Title 401, Water Resources.

Definitions/Dam Classification

KRS 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 KRS Chapter 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.

In addition, 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)

Jurisdiction/Powers of the Cabinet

The Secretary of the Natural Resources and Environmental Protection Cabinet is empowered by KRS 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

Kentucky

- 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. (KRS 151.124)

Permit/Approval Process

According to KRS 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 Division of Water, 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 KRS Ch. 350.

All applications for permit shall be in the form and manner prescribed by the Department. Plans and specifications must be drawn by a licensed professional engineer. Upon receipt of a complete application package (including 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. (KRS 151.250-260 and Regulation 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 (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. KRS 151 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).

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. (KRS 151.182 and 151.184 describes this hearing process.)

The owner or owners of a dam at which the Cabinet has taken emergency action are liable for the costs of such action. I.R.S. 151 requires the Cabinet to place a lien on the owner's property, file court action for recovery of the costs. The Cabinet may apply for foreclosure sale of the property to satisfy any judgment obtained. (KRS 151.297)

Penalties

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.

Emergencies

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. (KRS 151.297[2,3]) KRS 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.

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. (See K.R.S. 151.186)

Liabilities

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.

LOUISIANA

Citations

Laws pertaining to the dam safety program are found in LA.R.S. 38:21-28, effective 1981 and last amended in 1993. Rules and regulations were adopted in December 1996 and titled: "Dam Safety Rules and Regulations".

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" (LA.R.S. 38:22).

Dams are also classified according to "impact potential":

Impact Category	Potential Loss of Life	Potential Economic Loss	Minimum Inflow Design
Low	Not likely	Minimal	50-yr. frequency
Significant	Possible	Appreciable	100-yr. frequency
High	Likely	Excessive	½ PMF

(Table I "Impact Classification and Inflow Design Flood")

Jurisdiction/Powers of Department

The entity with responsibility is the Louisiana Department of Transportation and Development. The Assistant Secretary, Public Works and Intermodal Transportation is authorized to adopt rules and regulations for the construction, modification, operation and maintenance of dams (LA R.S. 38:24). The Assistant Secretary, Public Works and Intermodal Transportation is empowered to review and approve plans and specifications for construction, enlargement, removal, alteration, or repair of any dam. The Assistant Secretary, Public Works and Intermodal Transportation is also authorized to issue permits for these activities (LA R.S. 38:24). The Assistant Secretary, Public Works and Intermodal Transportation is authorized to make inspections during construction and operation (LA R.S. 38:24). Special inspections due to unusual or alarming circumstances are warranted at the discretion of the Assistant Secretary, Public Works and Intermodal Transportation. If deficiencies are found in a dam during inspection, the Assistant Secretary, Public Works and Intermodal Transportation may call for remedial work . The right of the State to take over a dam in the event of an emergency situation is stated in LA.R.S. 38:26B. The State does have the authority to invoke judicial action upon violators of provisions (LA.R.S. 38:28).

Permit/Approval Process

No one shall make, construct, or permit to be made or constructed any change in the dam without the written consent or permit of the Assistant Secretary, Public Works and Intermodal Transportation. No permit is required for routine maintenance, (LA R.S. 38:23). Plans and specifications must be prepared by a registered, professional engineer. After an application has been filed, containing the necessary plans and specifications, and accepted, a notice will be prepared regarding a public hearing. Inspections shall be completed as directed at the owner's expense. Filing fees are not currently assessed. Required design spillway criteria are found in Table I "Impact Classification and Inflow Design Flood".

Inspection Process

The Assistant Secretary, Public Works and Intermodal Transportation shall inspect all dams under his jurisdiction at least once every five years, with the exact frequency being determined by the Assistant Secretary, Public Works and Intermodal Transportation. Periodic inspections shall be made by the Assistant Secretary, Public Works and Intermodal Transportation during dam construction. Owner inspection requirements are contained in the "Maintenance and Operation Manual".

Owner Non-Compliance/Violations/Penalties

If after inspections, the Assistant Secretary, Public Works and Intermodal Transportation finds that conditions exist which do not permit a safe dam or reservoir, the prior approval may be revoked. 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 (LA.R.S. 38:28).

Emergencies

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

Liability

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 (LA.R.S. 38:27).

Oversight

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

Citations

1119th Maine Legislature, First Regular Session. (Through December 31, 1999)

Law regarding dam safety and inspection is found in Maine Revised Statutes Title 37-B “Defense, Veterans and Emergency Management” sections 1051-1070, Chapter 21 “Dams and Reservoirs”, and Chapter 22 “Dam Inspection”. The law was originally enacted in 1983 and revised in 1989 to include safety components separated from Title 38 Article 3-A “Dam Registration and Abandonment” sections 815-843. Title 37-B was again revised in 1997 with the inclusion of section 1065(5) “Correction of unsafe conditions” and 1080 “Establishment of Commission” to act in a technical advisory commission to the Department and the Governor on issues of flow of the States rivers and streams. In 1999, further revisions were made to update section 1065 “Inspection of Dams”, and a new section 1071 “Notice of transfer of ownership” was included to require dam owners to notify the Department of the name and address of new owners of high and significant hazard dams and maintain “competent operation” during the dam ownership transfer. Rules are found in the regulations Chapter 3 “Design and Construction Standards for New or Reconstructed Dams” adopted July 1990. These laws are currently under revision.

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, originally enacted in 1983 to include the safety components, amended in 1987 and changed to separate the safety components in 1989. This law is regulated by the Maine State Department of Environmental Protection.

Definitions/Dam Classifications

All Maine laws define a *dam* as any man-made artificial barrier, which impounds or diverts a river, stream or great pond, which is 2 feet or more in height and has an impounding capacity at maximum water storage elevation of 15 acre-feet or more. (section 817 (3), section 1052(2) and section 1061[2]).

Dam height means the vertical distance in feet 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 capable water storage elevation (section 817 [5]). 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):

Category	Urban Development	Economic Loss
Low Hazard	No permanent structures for human habitation	Minimal (undeveloped to occasional structures or agriculture)
Significant Hazard	No urban development and a small number of habitable structures	appreciable (notable agriculture, industry, or structures)
High Hazard	Urban development with more than a small number of habitable structures	excessive (extensive community, industry, or agriculture)

Jurisdiction/Powers of Department

In title 37-B MRSA, the safety of dams and inspection responsibility is under the authority of the Maine State Department of Defense, Veterans and Emergency Management, regulated by the Maine Emergency Management Agency (MEMA). Title 38 “Waters and Navigation” is under the authority of the Maine Department of Environmental Protection (DEP).

MEMA's Powers

When a emergency or imminent threat of dam failure or misoperation arises, according to law (section 1054), MEMA is empowered to take full charge and control of any dam, lower the water level, empty the reservoir, breach or remove the dam and take all steps necessary to safeguard life and property in the event of failure or impending failure.

According to law (section 1065), the inspection of and design standards for all dams shall be under the jurisdiction of MEMA except those mentioned above as exempt. 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 a emergency operations plan for dams of high and significant hazard, updated every 2 years. (section 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. (section 1053)

DEP's 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. (section 840 and 841)

Approval Process

MEMA

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. (Reg. 3.42). Spillway design criteria must be in accord with the U.S. Army Corps of Engineer's standards (Rule 3.52). This information must then be included in the Final Design Report submitted before construction begins (Rule 3.43). Design and construction standards for new and reconstructed dams are

included in the regulations. There are no requirements for the establishment of a bond by owners to secure funding for a project.

Inspection Process

MEMA

The law requires that the Director of Emergency management shall inspect:

- A. All dams that are listed in the 1981 United States Army Corps of Engineers' Inventory of Dams in the United States as "high" and "significant hazard" dams in the State,
- B. Any other new or existing dam that may, in the judgment of the director, constitute a potential threat to public safety; and,
- C. Any dams petitioned as per section 1070.

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 have a registered professional engineer 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.

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. At least once every 6 years; and,
- B. Within 30 days of receiving a notice of transfer of ownership of a high or significant hazard dam pursuant to section 1071, unless the hazard classification has been evaluated within 4 years preceding the proposed transfer.

The state dam inspector shall also conduct on-site inspections of the dams inspected to determine if the integrity, structural stability and function of the dams constitute a threat to public safety downstream of the dams. The state dam inspector shall issue a report on the material condition of each dam that must describe in detail any material condition that constitutes a threat to public safety. The engineering process, mathematical calculations and complete documentation justifying the assessment of the current material condition must be provided to the director. The director shall conduct on-site structural stability inspections of all dams in the State classified as high or significant hazard dams on the following schedule:

- A. At least once every 6 years; and
- B. Within 30 days of receiving a notice of transfer of ownership of a high or significant hazard dam pursuant to section 1071, unless the hazard classification has been evaluated within 4 years preceding the proposed transfer.

When the director issues an order under this subsection, the director shall ensure that a state dam inspector is available to provide technical assistance to the owners, lessees or persons in control of the dam and to the municipality in which the dam is located.

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. (Sect. 1065 and Rule 3.1 (d))

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 (section 1059).

Emergencies

Within 6 months of the state dam inspector determining the dam is a high or significant hazard, the owner is required to submit an emergency operations plan and update it every 2 years. These plans are required to be kept and available on file at the local county offices. (section 1069). The laws also require MEMA to develop contingency plans for safe passage of water prior to a flood condition. (Law Sect. 1054)

Liability

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 (section 1066). 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 (section 1058). 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. (section 1057).

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.

Transfer of ownership

Section 1071 requires 45 days notice of the change of ownership of high and significant hazard 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”.

Miscellaneous

Section 1068 gives MEMA full access to any dam under the Departments jurisdiction for the purposes of inspection or enforcement. The dam owner and persons in control of a dam are given full access to the dam over land abutting the dam property.

Section 840 establishes procedures for establishing and maintaining water levels by petition upon motion by the Commissioner, the owner upon receipt of petitions from the lesser of at least 25% or 50 of the littoral or riparian proprietors or from a water utility withdrawing from the water body. Excluded from this process are dams operating under a FERC license, IJC jurisdiction, municipal ordinance or interlocal agreement, land use and small hydroelectric laws and other statutes regulating the construction or operation of dams.

Other laws in Maine have an effect on dam safety. Construction and repair of dams and hydraulic structures may be subject to one of several other state laws. These include the Natural Resources Protection Act (for great ponds, streams, and wetlands alterations); the Maine Waterway Development and Conservation Act (for hydropower dams); and, the Land Use Regulation Law (for activities in the unorganized territories).

MARYLAND

Citations

Laws are found in the Environment Article 5-203, and 5-501 through 514, amended 1995. The Maryland dam safety regulations are contained in the Code of Maryland Regulations 1988, Title 26; Maryland Department of the Environment, Subtitle 17; Chapter .04, Construction on Non-Tidal Waters and Floodplains.

Definitions/Dam Classification

The Code of Maryland Regulations (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 Water Management Administration (MDE), 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]):

Category	Normal Pool Storage	Normal Vol. Depth	Potential Loss of Life	Potential for Damage
I	20,000 ac-ft or more	50 ft or more	probable	Serious damage to residential, industrial or commercial buildings, public roads or RR
II	Greater than 1000 ac-ft and less than 20,000 ac-ft	Greater than 25 ft and less than 50 ft	small possibility	Located in predominantly rural or agricultural areas where failure may cause damage to isolated residence or cause interruption of use or service of public utilities or roads. Damage is within the financial capability of owner to repair.
III	Less than 1000 ac-ft	Less than 25 ft	very unlikely	Damage is of same magnitude as cost of dam and within financial capability of owner to repair

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 (ACM 26.17.04[B]).

Jurisdiction

The Department of the Environment (MDE; hereafter referred to as the Department) has general supervisory power, regulation, and control over the natural resources of the State of Maryland within the boundaries of the tidal waters. (Environment Article 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.

Maryland

The law gives power to the Department to issue a permit for construction, reconstruction, or repair of any reservoir, dam, or waterway. 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]).

An applicant shall agree to allow reasonable inspection of the proposed project site by representatives of the Water Management Administration (hereafter referred to as the Administration).

Environment Article 1-107 explicitly states that the Department has the power to make rules and regulations.

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.

Permit/Approval Process

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 26.17.04.

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

State

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.

Owner

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

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 (5-514) 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.

Emergencies

In the event of an emergency in which repairs are necessary to safeguard life and property against predicted immediate danger, these repairs shall be made immediately by the owner. 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 expeditious means for notifying potentially affected persons in close proximity to the dam or property owners (COMAR 26.17.04-.05A[3][b][ix]).

Liability

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 26.17.04.05E[1][2]). Liability of the state is not explicitly defined in the laws or regulations.

Maryland

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.

MASSACHUSETTS

Citation

Massachusetts dam safety law is contained in Massachusetts General Laws, Chapter 253, Sections 44 through 52. The provisions were originally enacted in 1900 and were last amended in 1985. Rules and regulations pertaining to Massachusetts dam safety are found in C.M.R. 302 10.00 - 10.17, adopted 4/14/89.

Definitions/Dam Classification

M.G.L. c. 253 s. 44 of the statutes 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 as defined herein and (2) has an impounding capacity at maximum water storage elevation of fifty acre-feet or more. A jurisdictional dam is any dam over six feet in height, regardless of storage capacity, or with a storage capacity of over fifteen acre-feet, regardless of height. Also covered under the dam safety law and regulations are any other artificial barriers, including appurtenant works, the breaching of which could endanger property or safety, as determined by the Commissioner; or any structure classified as a roll dam. (See also C.M.R. 10.00). Exempted from the provisions are dams and reservoirs licensed by the Federal Energy Regulatory Commission, and those owned and operated by the Metropolitan District Commission, and the Massachusetts Water Resource Authority.

Height of dam is defined in C.M.R. 10.00 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".

Hazard Classification: (C.M.R. 10.09)

Classification	Hazard Potential
High Hazard (Class I)	failure will likely cause loss of life and serious damage to homes, industrial or commercial facilities, important public utilities, main highways, or railroads
Significant Hazard (Class II)	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
Low Hazard (Class III)	failure may cause minimal property damage to others. Loss of life is not expected

Jurisdiction/Powers of Department

M.G.L. c. 253 s. 45 empowers the commissioner of environmental management 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. Section 46 grants the commissioner the authority to inspect and order the inspection of dams. Powers listed under M.G.L. Section 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. Section 48 allows the commissioner to order that costs incurred by the state under the proceedings of Sections 45-47, be paid by the owner.

Regulations promulgated under the state dam safety program provide further authorizations: 1) The Department of Environmental Management is authorized to supervise the construction, alteration, repair, removal, enlargement, and emergency action plans of jurisdictional dams in Massachusetts (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 (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 (C.M.R. 10.11).

Permit/Approval Process:

M.L.G. c.253 s. 45 requires that persons wishing to build a dam first apply for a permit from the commissioner. Permit applications must be accompanied by plans, specifications, and other documents. Documents must be certified and construction must be supervised by a registered professional civil engineer. The engineer must also 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 (See C.M.R. 10.14). 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

M.G.L. c.253 s. 46 states that every dam shall be inspected by the commissioner according to a schedule established by regulation. The schedule is listed in C.M.R. 10.10 as follows: (Inspection times are maximum length of time between inspections, and may be modified at the discretion of the commissioner.)

Hazard Potential	Size Classification	Inspection Frequency (years)
Low	Small	10
	Intermediate	10
	Large	5
	Very large	5
Significant	Small	5
	Intermediate	5
	Large	2
	Very large	2
High	Small	2
	Intermediate	2
	Large	1
	Very large	1

A dam owner may be required by the commissioner to cause a thorough examination of the dam, the performance of specified tests by a registered professional engineer, who shall certify as to the condition and adequacy of the structure. (M.G.L. c.253 Section 46)

C.M.R. 10.10 provides that the dam owner may wish to employ the services of a registered professional engineer to inspect the dam according to the same schedule as above, and shall furnish a copy of each completed inspection form to the department within 30 days of the inspection date.

Owner Non-Compliance/Violations/Penalties

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, s. 47. No fines are cited in the laws or rules.

Emergencies

M.G.L. c. 253 s. 47 cites powers of the department to take corrective action to abate a threat to safety and property. C.M.R. 10.14 of the regulations 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.

Liability

According to M.G.L. c. 253 s. 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, C.M.R. 10.16 of the regulations 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.

Oversight

The appeal process is not found in the statutes or the regulations.

Miscellaneous

The state has a dam registration program, which is described in 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.

Citation

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. Draft rules have been promulgated.

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. (Sec. 31503 [10])

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. (Sec.31503 [11])

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. (Sec. 31505 [5])

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. (Sec. 31504 [2])

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) The department may in an emergency take any necessary actions, including repair, drawdown, breaching or cessation of operation to protect public safety, natural resources and the public trust. Department personnel have conditional right of entry to a dam site. (Sec. 31527) The department may limit dam operation or order dam removal in order to protect public health, safety, welfare, natural resources and the public trust.

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. Applications shall be accompanied by appropriate fees according to the following schedule: (Sec. 31509 [3] [4])

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

A licensed professional engineer shall prepare all plans and specifications, except for minor projects. (Sec. 31508[1]) Upon receipt of an application for a permit, the department shall accept or reject the permit within 60 days, or 120 days if a public hearing is held (Sec 31512). Required spillway design criteria are found in Sec. 31516.

After construction of a permitted dam and a statement from the project engineer advising that the dam was built in conformance with approved plans and specifications, the department shall inspect and file written notice of approval for the dam. (Sec. 31517)

Inspection Process

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

The department shall 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 Non-Compliance/Violations/Penalties

The Dam Safety Act provides remedies and penalties, both criminal and civil, for violations of the act, permit conditions, and department orders. (Sec. 31524 and 31525) Included in these remedies is authorization to the department to cause an inspection report to be prepared and to recover costs in a civil court in the event that a dam owner refuses to submit an inspection report as required by the Dam Safety Act. (Sec. 31518 [6])

Emergencies

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. (Sec. 31523) Dam owners are required to notify the department of emergencies at the owner's dam.

The director may order an owner to immediately repair, draw down, breach, or cease operation of a dam where a dam is in imminent danger of failure and is threatening the public health, safety, welfare, property, natural resources or public trust. (Sec. 31521)

Liability

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. (Sec. 31529) A state Supreme Court ruling provides a level of liability to state employees.

Oversight

Any person aggrieved by any action or inaction may request a hearing of the matters involved. The hearing shall be conducted by the department in accordance with the Administrative Procedures Act of 1969. (Sec. 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.

MINNESOTA

Citation

Minnesota's dam safety law is contained in Minnesota Statutes, Chapter 779 (1978), last amended in chapter 105 (1979). Rules pertaining to Minnesota dam safety program are found in Public Water Resources Rules Parts 6115.0010-6115.0810.

Definitions/Dam Classification

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:

Class I - any loss of life or 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.

Jurisdiction/Powers of Department

The law states that the Department of Natural Resources supervises the safety of dams and reservoirs as part of its overall supervision of water conservation. The Commissioner of the Department of Natural Resources 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 (MRS 105.535), 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.

Minnesota

The Minnesota law contains a separate section on powers of the commissioner concerning state-owned or local government unit-owned dams (MRS 105.48). 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. (MRS 105.482)

The Commissioner in an emergency may take any steps necessary to protect life and property.

Permit/Approval Process

The law gives the commissioner authority to issue or deny permits for the construction, operation, alteration, repair, or remove a dam without a permit. (MRS 105.42) The general permit provisions are contained in the law (MRS 105.45) but the rules describe the permit process in detail. This section includes instructions on application for permits, the preliminary report, filing fees, engineers' requirements, design requirements (although no design standards are listed), plans and specifications, and permit standards. Separate impoundment approval procedures for Class I and II dams are described in the rules.

An application for each new dam, or each dam proposed for enlargement, shall be filed with the commissioner. A certified engineer must complete plans and specs. Each application must contain a non-refundable \$30.00 filing fee. No state agency or subdivision of the state shall be charged a fee according to the law.

The statutes go on to say that a permit to repair may be waived in emergency situations. (MRS 105.45, Subd. 2)

Inspection Process

State

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 (MRS 105.52). The commissioner shall inspect Class I dams at least once a year, Class II dams at least once every four years, and Class III dams least once every eight years. The rules describe what should be included in an inspection. The rules call for a written report of every inspection, including recommended corrective action, submitted to the department and to the owner.

Owner

The law states that the owner has responsibility for the maintenance, repair, and liability of his structure. The rules require the owner to keep inspection schedules and performance reports may have to be submitted annually.

Fees

The rules lay out the fee structure. The initial fee required shall be based on the following formula:

- For the first \$100,000 of estimated costs a rate of 2 1/2%
- For the next \$400,000, 1 1/2%
- For the next \$500,000, 1%
- For all costs over \$1,000,000, .50%

Other rates are calculated for dams where the final costs exceed the estimate, and where maximum storage level will not be constructed immediately.

Periodic fees shall be charged for each year an inspection is made of \$30 per dam plus an additional fee based on surface of \$.01 per square foot for the first 1,000 and \$.001 for each square foot in excess of 1,000.

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 (MRS 105.541). No fines for violations are mentioned.

Emergencies

The commissioner may take any steps deemed necessary to protect life and property. The rules require owners of Class I dams to file EAPs. The rules list items that need to be included in an EAP.

Liability

Nothing in these rules shall be construed to relieve the dam owner or permittee of the legal duties, obligations or liabilities incident to ownership or operation of the dam (1.5034 B). There is nothing in the dam safety legislation about state liability.

Oversight

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

Miscellaneous

1. Citations for small dam design criteria are separate from the regular rules.
2. The law orders the commissioner to report annually to the legislature on the state of local dams in need of repair or reconstruction in order of priority.
3. The statutes include language on transfers of ownership of dams and the approval process for this.
4. 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.

MISSISSIPPI

Citation

Laws pertaining to Mississippi dam safety are found in Mississippi Code of 1972, Sec. 51-3-1 to 51-3-55. Regulations are found in Surface Water and Ground Water Use and Protection Regulations Section VII, revised 1994.

Definitions/Dam Classification

Dam -- 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 of Dams:

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.

Jurisdiction/Powers of Department

Any person proposing to construct, enlarge, repair or alter a dam or reservoir shall submit an application to the Commission on forms prescribed by the Commission at least thirty (30) days prior to commencement of construction. Except as otherwise provided in this section, written authorization must be obtained from the Commission prior to commencement of construction. Detailed drawings showing plan and cross-section views shall be required when necessary to determine if the proposed structure is designed to meet hazard classification regulations set forth herein. Prior written authorization is not required for emergency repairs to a dam that is likely to breach.

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 therefor was required under these regulations, may do so only by making an application for and obtaining a surface water use permit.

Written construction authorization shall not be required for any dam to impound water which:

- a. is a peripheral dam of eight (8) feet or less in height, measured from the point of lowest elevation of the toe of the dam, regardless of the impounded storage volume
- b. impounds twenty-five (25) acre-feet or less of water at maximum storage volume
- c. does not impound a watercourse with a continuous flow of water, as determined by the Commission
- d. notwithstanding the provisions of this paragraph, any person proposing to construct, enlarge, repair or alter a dam or reservoir shall submit an application in accordance with Section VII.A.1 of these regulations.

Design plans and construction drawings shall be submitted to and approved by the Commission prior to commencement of construction of a high hazard dam.

The Commission's receipt, comment, or approval of any design, construction, or modification does not relieve the dam's owner, consulting engineer, contractor, equipment supplier, attorney, or any other party of any liabilities or responsibilities. 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.

Permit/Approval Process

Before construction, enlargement, repair, or alteration of any dam, one must fill out written applications on forms provided by the Commission, and detailed plans shall be required when deemed necessary by the Commission in order to determine safety. Remedial work shall be done at the owner's expense, (M.C. 51-3-39).

Prior approval by the Commission is not necessary when undertaking emergency repairs according to the regulations.

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 is an owner is going to draw water from the reservoir. The regulations spell out this permitting procedure.

There are no filing fees.

Inspection Process

The Commission shall be authorized to make inspections of dams and reservoirs, regardless of whether or not written construction authorization therefor was required. Inspection schedules are determined by the Commission, and inspection fees are not assessed.

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. 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. (MC 51-3-55).

Emergencies

The Commission may direct the owner of a high hazard dam to develop an Emergency Action Plan (Regulations Section 7-C 15).

Liability

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., 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.

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.

Miscellaneous

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

MISSOURI

Citation

Laws pertaining to Missouri dam safety are found in Sections 236.400 - 236.500 of the Revised Statutes of Missouri (RSMo.) -- enacted in 1889 and last amended in 1993. Rules are found in Code of State Regulations 10 CSR 22-1.010 to 10 CSR 22-4.020.

Definitions/Dam Classification

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. (Section 236.400(5) RSMo.)

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 Mo. dam safety law. (10 CSR 22-1.020)

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 CSR 22-1.020(24))

Hazard Classification

The hazard classification criteria are defined in the rules as the "downstream environmental zone." 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 CRS 22-2.040(1))

Jurisdiction/Powers of Department

The Dam and Reservoir Safety Council (the "council") of Missouri oversees the safety of dams and reservoirs (Sect. 236.410.1 RSMo). Membership on the council is described in Section 236.410.2 RSMo.

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. The Department 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 CSR 22-1.010)

According to the law, the Chief Engineer of the Dam and Reservoir Safety Program (heretofore the "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. (Sect. 236.425 RSMo.) The chief engineer may take any action deemed necessary in emergency conditions to ensure safety. (Sect. 236.455 RSMo.) The chief engineer has the statutory authority to hold public hearings and must do so before regulations are approved. (Sect. 236.425 RSMo.)

Permit/Approval Process

Owners of jurisdictional dams must obtain a permit as required by law. (Sect. 236.435 and 236.440 RSMo.) Instructions for applying for a permit for an industrial retention structure are included in Section 236.465 RSMo. More specific requirements for the approval process are included in the rules, 10 CSR 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 CSR 22-3.010 to 3.050)

Permits are transferable under Section 236.460 RSMo. with the approval of the chief engineer.

Construction must commence within one year of approval. (10 CSR 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 CSR 22-2.010(5))

Permit revocation is at the discretion of the Council or the chief engineer and is described in the rules (10 CSR 22-2.080). The Council can suspend a permit due to unsafe conditions at a dam.

There are no fees included in the laws regarding permitting.

Inspection Process

Dams shall be inspected by an experienced professional engineer before a registration or safety permit will be issued. (10 CSR 22-3.030 and 10 CSR 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. (10 CSR 22-3.030)

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. (Sect. 236.445 RSMo) Owners are not required to have a bond to ensure the financial capability of the project.

Owner Non-Compliance/Violations/Penalties

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. Civil penalties of up to \$1000 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. (Sect. 236.500 RSMo.)

Emergencies

After a structure has been classified as dangerous to public safety, life or property, the chief engineer may take any action deemed necessary in emergency situations to protect life and property. (Sect. 236.455 RSMo.) Costs to take such action may be recovered from the owner through legal action. Emergency action plans are required by regulation (10 CSR 22-3.030(1)(B) and 3.040(1)(A)15).

Liability

In the absence of willful misconduct, no action shall be brought against the council, the chief engineer, or his agents or department employees for the recovery of damages due to dam failure or operation. (Section 236.475 RSMo.)

Oversight

Permit revocations or denials are subject to council appeal. (10 CSR 22-2.100) Any party shall be afforded an opportunity for hearing before the council for review of denial or revocation decisions. A description of the hearing process is included in Section 236.470 RSMo. All decisions are subject to judicial review according to the law.

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. (Sect. 236.430 RSMo.)

The council bases its judgment upon the recommendations of the chief engineer.

Citation

Montana dam safety laws are contained in the Dam Safety Act-Chapter 15 (85-15-101 through 503), last amended in 1993. Dam Safety Rules are contained in Title 36: Department of Natural Resources and Conservation; Chapter 25: Safety of Dams 1988.

Definitions/Dam Classification

Montana law defines a *dam* as any artificial barrier, including appurtenant works, used to impound or divert water.

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 failure of the dam (85-15-106[9]).

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

Jurisdiction

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 (hereafter referred to as "the Department").

The law grants the Department the power to adopt rules to classify high-hazard dams and reservoirs; to 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 procedures and to establish fees commensurate with costs to cover inspections under the law (85-15-110).

The Department may also invoke legal counsel to enforce the laws and rules and to conduct proceedings under it (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 (85-15-216).

The Department may take over a dam in the event of an emergency (85-15-215).

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 prior to any construction (85-15-210).

An application for a construction permit must include the application form, engineering design report, and three sets of the construction plans and specifications.

Administrative rule 36.14.309(1)(b), as adopted in Jan. 1989, 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. 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.

For all high-hazard dams, the department shall require an operation permit and impose such reasonable conditions as are necessary to ensure that high-hazard dams are safely operated and maintained. All high-hazard dams must undergo an inspection to determine hazard classification (see inspection process).

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. All high-hazard dams undergo an inspection by a licensed engineer on a frequency prescribed by the department, but not less than once in 5 years.

Spillway design criteria are found in the Rules (36.14.502).

Inspection Process

State

Inspections by the state are limited to construction inspections and those performed for the following purposes: a) resolution of complaints, b) determination of hazard classification. 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.

85-15-213 MCA states that a dam must be inspected as often as considered necessary by a private sector professional engineer but at least once every 5 years.

A \$125 fee has been established for inspections to determine hazard classification (85-15-209 MCA).

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. The frequency of periodic inspections shall be set by the department after considerations including the condition of the dam, proximity to population centers, current design technology, and type of construction. The owner shall bear the cost of the inspection.

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.

Emergencies

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).

Liability

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 (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 76-5-103 MCA.

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.

Oversight

Someone whose property may be endangered by an unsafe dam may file a complaint with the Department (85-15-214 MCA).

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

Section 85-15-305 MCA 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.

NEBRASKA

Citation

Laws pertaining to dam safety are located under Chapter 46, Article 2: "Surface Water". Regulations are in Title 457: Rules for Surface Water - Department of Water Resources. Guidelines for dam operations can also be found in "A Guide for Preparing Emergency Preparedness Plans for Dams and Reservoirs".

Definitions/Dam Classification

The laws and rules do not explicitly define the term *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.

Jurisdiction/Powers of Department

As defined in the laws, section 46-209, the Department of Water Resources 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 rules governing matters coming before it and seek judicial remedies to enforce these rules.

Section 46-277 of the laws empowers the Department to make inspections of dams with a storage capacity of fifty acre-feet or more below the top of the dam or a height of twenty-five feet or more.

Section 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.

Section 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.

Permit/Approval Process

Section 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 of Water Resources 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.

Section 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 Ch. 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.

Remedial work is paid for by the owner, per 46-277. There is no reference in the laws or regulations pertaining to bonding requirements or filing fees.

Inspection Process

Section 46-277 requires the owner of any dam with an impounding capacity of fifty ac-ft or more or a height of twenty-five feet or more to keep the dam in a state of repair. Owner inspection recommendations can be found in the Guide (page 55). The Department may conduct inspections, when the Director determines it necessary, of dams with an impounding capacity of 15 ac-ft or more.

The laws do not require that the inspections be conducted by a licensed engineer. There is no reference to inspection frequency or inspection fees.

Violations/Penalties

Any owner or owners of a dam who neglect or refuse to repair the dam within three months after receiving written notice from the Director of Water Resources to do so, shall be guilty of a Class V misdemeanor, and every day that the owner or owners neglect or refuse to repair the dam, after the three months has expired, shall be considered a separate offense (46-278).

Emergencies

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. EPPs are required per the Rules Chapter 12-005.

Liability

Section 46-241 (2) of the law 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.

Oversight

The Department has authority to call for public hearings upon complaints, petitions, or applications in connection with any matters under its jurisdiction.

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 (46-246).

Citation

Chapter 535 of the Nevada Revised Statutes 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.

Definitions/Dam Classification

Nevada statutes do not provide a general definition of the term *dam*, nor is a dam classification system described.

Section 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.

Jurisdiction/Powers of Department

The powers and duties of the state engineer are listed in NRS Section 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 fishways 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. In the case of a dam that is in a condition that threatens life and property, the state engineer may take the following remedial measures:

- 1) Lower the water level by releasing water from the reservoir,
- 2) Empty the reservoir, or
- 3) Take such other steps as may be essential to safeguard life and property.

No additional powers relating to the responsibilities of the state engineer are listed in the dam safety statutes.

Permit/Approval Process

NRS Section 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 plans and application must be accompanied by a \$500 filing fee.

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 plans and specifications must be prepared by a registered engineer. In addition, general recommendations for spillway design are given, although law designates no specific criteria. No provisions are made for bond requirements.

Inspection Process

Although an inspection schedule is not specified, the state engineer is authorized by law to inspect dams under construction and existing dams at any time. The law does not require dam owners to conduct inspections according to a set schedule, but owners are obligated to pay for any remedial work necessary to satisfy state safety requirements. The law does not identify different criteria for construction and maintenance inspection, nor are there provisions for inspection fees. It is Nevada's intent to inspect all high hazard dams annually, moderate hazard every 3 years & low hazard every 5 years.

Owner Non-Compliance/Violations/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."

Emergencies

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. Emergency Action Plans are not specifically required under Nevada law or regulations.

Liability

No liability clauses are found in the statutes or regulations of Nevada.

Oversight

All orders and decisions of the state engineer may be appealed pursuant to NRS Section 533.450.

NEW HAMPSHIRE

Citation

New Hampshire dam safety laws are contained primarily in RSA Chapter 482, originally enacted 1937 and last amended in 1998. Regulations are published in Chapter ENV-WR 100 - 800 of the NH Code of Administrative Rules (NH Water Division, Dept. of Environmental Services). These regulations became effective in 1980 and 1981, and were last amended in 1997.

Definitions/Dam Classification

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". Part ENV-WR 101 of the Administrative Code (regulations) 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 Part WR 101.03-101.06 of the regulations.

Jurisdiction/Powers of Department

RSA Chapter 482 grants the Division of Water 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 construction of new dams located at the outlet of a great pond must be approved by the division (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.

Permit/Approval Process

Existing dams must be registered with the Division of Water according to the provisions of RSA Chapter 482:5 and 482:6, and Parts ENV-WR 302 and 303 of the regulations.

RSA Chapter 482:9-11 contains statutory provisions relating to the erection of new dams. Persons must file a statement with the Division of Water before the start of construction. 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

The division may designate an inspector to inspect construction or reconstruction and to report any non-compliance with filed plans and specifications. 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. Chapter 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 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

Parts ENV-WR 304 and 306 contain special application procedures for the construction or reconstruction of dams on great ponds, and of mill dams. Part 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.

Inspection Process

Chapter 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 Chapter 482:16.

Chapter ENV-WR 500 of the regulations 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. Part 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 Part 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. (See Part ENV-WR 504.08)

Owner Non-Compliance/Violations/Penalties

Penalties and injunctions shall be in accordance with RSA Chapters 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.

Emergencies

RSA Chapter 482:4 provides that "Whenever 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, Part ENV-WR 305.03 of the regulations 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 Part ENV-WR 505 of the regulations, Guidelines for the Development of an Emergency Action Plan.

Oversight

RSA Chapter 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.

Chapter ENV-C 200 of the regulations, Rules of Practice and Procedure, 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.

Miscellaneous

Under the provisions of RSA Chapter 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.

RSA Chapter 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.

1. New regulations/statutes establish a registration fee for dams, to be paid by owners every year in accordance with RSA Chapter 482:8-a. The fees range from \$100 to \$600 depending on dam size/classification.

NEW JERSEY

Citation

Title 58, Chapter 4 of the New Jersey Revised Statutes is entitled "Laws Relating to Construction, Inspection, Repair and Safety of Dam and Reservoirs". The title, also known and cited as the "Safe Dams Act" was originally enacted in 1912 and last amended in 1981. Rules and regulations relating to dam safety are in Section 7:20-1.1 et seq. of the New Jersey Administrative Code. These rules were first adopted in 1985, were updated in 2000, and will be updated every five years hereafter. Both the laws and the regulations are published in Parts III and II of the State of New Jersey Dam Safety Manual (Department of Environmental Protection, Division of Engineering and Construction, Dam Safety Section).

Definitions/Dam Classification

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, as designated by C. 13:18A-11, 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.

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. 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 (NJRS 58:4-5).

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.

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 preapplication 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 preapplication 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 preapplication, 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 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%

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 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.

Owner Non-Compliance/Violations/Penalties

N.J.R.S. Title 58, Chapter 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))

Emergencies

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 EAPs must include a Dam Breach Analysis, Inundation Maps, and Emergency Notification and Evacuation Plans.

Liability

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.

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.
3. The Department may require the submission of an Environmental Impact Statement by any applicant for a dam permit.

NEW MEXICO

Citation

New Mexico dam safety law is contained in New Mexico Statutes Annotated Chapter 72, 1985 Repl. Pamphlet, originally enacted in 1907. Regulations related to dam safety are found in the Manual of Rules and Regulations Governing the Appropriation and Use of Surface Waters of the State of New Mexico (Manual), last revised in 1987.

Definitions/Dam Classification

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.

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.

In order to determine the extent to which a dam should be included in the state inspection program, size and hazard classifications are assigned as follows (From the US Army COE "Recommended Guidelines for Safety Inspections of Dams, Sept. 1979.):

Size Classification:	Storage (Acre-Ft)	Height (Ft)
Small	Less than 1000 and greater than 50	Less than 40 and greater than 25
Intermediate	Less than 50,000 and greater than 1000	Less than 100 and greater than 40
Large	Greater than 50,000	Greater than 100

Hazard Classification:	Loss of Life	Economic Loss
Low	Extent of development – none. No permanent structure for human habitation.	Extent of development – minimal. Undeveloped to occasional structures or agriculture
Significant	Few (No urban development and no more than a small number of inhabitable structures)	Appreciable (Notable agriculture, industry or structures)
High	More than a few	Excessive (Extensive community, industry or agriculture)

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 NMSA Chapter 72, 1985 Repl. Pamphlet. 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 (explained in Article II of the Manual), 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, 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.

In addition, Article V of the Manual gives the engineers and surveyors of the State the right to enter upon public or private lands or waters for the purpose of examining or surveying the location of works for irrigation or other beneficial water uses.

Permit/Approval Process

Chapter 72, NMSA requires 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. Although New Mexico regulations do not specify criteria for the design and construction of dams, 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 Article VI of the Manual. All field surveys must be completed by a registered professional engineer.
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 Article II of the Manual of 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.

Article VII of the Manual of Rules and Regulations lists the fees charged for various aspects of the appropriation and use of surface waters:

- For filing notice of intention to make formal application, \$25.00
- For filing a formal application, the amount of the fee depends on the type of project. For diversion and direct use, \$25.00 plus \$5.00 for each cubic foot of water in excess of 5 cubic feet per second. For storage of excess and flood waters, \$10.00 for each 1000 acre-feet of storage capacity. For power projects, \$25.00 plus \$1.00 for each cubic foot of water in excess of 5 per second; for flood control dams, \$10.00. If a fee for notice of intention has been paid, this amount may be deducted from the fee for formal application.
- For examining the plans and specifications in connection with an application, \$2.00 per \$1000 of estimated cost of the dam, and/or \$25.00 plus \$10.00 for each 50 cubic feet of water per second for canal or water conduit projects.
- 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 per day plus travel expenses.

Inspection Process

The state engineer is required by law (see Chapter 72-5-9 NMSA) to inspect, or cause to be inspected, any completed construction to determine the actual capacity, safety and efficiency before issuing a certificate of construction. 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. Evaluations of spillway capacity are made using US Army Corps of Engineers Recommended Guidelines for Safety Inspections of Dams, Sept. 1979. 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.

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 owners 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.

Owner Non-Compliance/Violations/Penalties

Chapter 72-5-12 NMSA describes penalties for owners who, after having been notified of unsafe conditions and the required corrections, fails 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.

Emergencies

No provisions are made, either in the statutes or the regulations, for action in the case of dam emergencies.

Liability

Chapter 72-5-11 NMSA states, "Nothing 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.

Oversight

Article II (G) prescribes the procedures for the filing of protests and conduct of hearings relative to the granting of a proposed permit application. An appeal from the decision of the state engineer on a protested application may be taken to the District Court within whose jurisdiction the land lie.

Miscellaneous

1. Article VI of the Manual lists in detail the filing requirements for plans and specifications. In addition, the state provides permit applicants with Engineering Review Project Checklists for use in preparing plans and specifications and during construction of the dam and appurtenances.
2. 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. Provision for a Declaration of Water Rights is made in Article IV of the Manual, and Article I sets forth constitutional provisions and general principles of appropriation of water for beneficial purposes.
3. Finally, specific procedures for the design and construction of stock-water dams are outlined in Article VI, Filing Maps, Plans and Specifications. Procedures for which requirements are listed include the preparation of foundation, embankment, outlet, spillways and borrow pits.

Publications:

- 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
- A Dam Owner's Guidance Manual – New Mexico Edition, March 1989

NEW YORK

Citation

New York's dam safety statutes are contained in the Environmental Conservation Law (ECL), Article 15, Title 5. Title 5 was last amended in July 1999. The Dam safety provisions derive from the Conservation Law of 1911.

Regulations are contained in Title 6 of the New York Code of Rules and Regulations (NYCRR) Part 608 and Part 673. Part 608, "Use and Protection of Waters", defines activities requiring permits and permitting standards. Part 673, "Dam Safety Regulations," defines the authority and procedures for the State's inspections and enforcement activity. The process to modify Part 608 and Part 673, to conform to the July 1999 statutory changes, is underway at time of printing.

Definitions/Dam Classification

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. (6NYCRR 608) (permit regulations)

Dam means any artificial barrier, together with its appurtenant works, constructed for the purpose of impounding water. (6NYCRR 673) (Inspection and enforcement regulations)

Hazard classifications are defined in 6NYCRR 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.

Jurisdiction/Powers of Department

The New York State Department of Environmental Conservation is charged with implementation of the Environmental Conservation Law (ECL), which includes dam safety provisions.

ECL 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 subdivision 2 of this section.

ECL 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."

ECL 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 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 ECL 15-0507 is 6NYCRR Part 673. Part 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.

Part 608 defines "reconstruction or repair" to include breaching or removal of a dam.

Permit/Approval Process

Part 608 states that a dam permit application must include application forms, a location map, a site plan, a design report, construction plans, 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 NYCRR describe procedures and time frames for Department review of permit applications. Provisions for public notification and comment are elements of these procedures.

Part 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.

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.

Part 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 (dam-break analysis, inundation mapping) for such a request.

Part 673 authorizes the Department to serve a hearing notice on the owner anytime after an investigation. (Hearing procedures are contained in 6NYCRR Part 622.) After hearing, the Commissioner can issue an order directing the owner to repair or remove the dam.

Owner Non-Compliance/Violations/Penalties

Enforcement of Article 15 is provided for in ECL Article 71 Title 11.

A violation of ECL 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. (ECL 71-1107) Additionally, ECL 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 ECL 15-0507, as described immediately below.

Violation of an order issued pursuant to ECL 15-0507 and 6NYCRR Part 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. (ECL 71-1109). Additionally, Part 673 authorizes the Department to enter the property upon which the dam is situated for the purpose of executing the order; the cost may be charged against the owner in accordance with ECL 15-0507.

Emergencies

ECL 70-0116 and 6NYCRR Part 608 provide that the Department may issue an emergency authorization for work which 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.

ECL 71-0301 and 6NYCRR Part 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 \$2500 per violation plus up to \$500 per day for continuing violations.

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.

Liability

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.

Oversight

ECL 15-0515 provides that the issuance, modification or denial of a permit, pursuant to ECL 15-0503 (dam permit) shall be subject to review pursuant to Article 78 of the New York Civil Practice Law and Rules (CPLR).

ECL 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.

NORTH CAROLINA

Citation

Laws pertaining to North Carolina dam safety are found in G.S. 143-215-23, last amended in 1995. Rules regarding dam safety are found in North Carolina Administrative Code Title 15A -2K, last amended in 1995. Authorization for establishing permit fees became effective November 1, 1990.

Definitions/Dam Classification

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) 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.

Classification: (Rule .0105)

Class	Classification	Failure results in
A	Low Hazard	damage to uninhabited non- residential areas and low volume roads
B	Intermediate Hazard	damage to highways, public utilities, and minor damage to isolated homes
C	High Hazard	damage causing loss of life or serious damage to homes, primary highways and public utilities

Jurisdiction/Powers of Department

The North Carolina Department of Environment and Natural Resources 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.

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. 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 shall within 60 days of receipt, notify applicant of approval or denial. No construction shall begin until Certificate of Approval is obtained. (Rule .0202) All plans and specs shall be prepared by a professional engineer. (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. (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. The following additional processing fees are due when as-built plans are submitted and are based upon a percentage of the cost of construction and removal of the dam.

Costs of Construction	Fee
Between \$10,001 and \$100,000	2%
Between \$100,001 and \$500,000	1.5%
Between \$500,001 and \$1,000,000	1.0%
Over \$1,000,000	0.5%

The total fee cannot exceed \$50,000.

Inspection Process

An effort is made by the department to inspect all Class A and B dams at least once every five years, and Class C dams are inspected once every 2 years. 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.

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 - \$1000, civil penalties of up to \$500 per day of violation, and injunction relief.

Emergencies

The department may issue orders for remedial work, and may take any necessary actions in an emergency to protect life and property (Rule .0302). Emergency Action Plans are required as a condition of impoundment for all new high hazard dams.

Liability

Dam owners are in no way relieved of any liabilities or legal obligations. (Rules .0302) G.S. 143-215.35 of the statutes absolves the state from liability from damages caused by a dam failure.

Oversight

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).

NORTH DAKOTA

Citation

Dam safety laws are found in Section 61 of the North Dakota Century Code (NDCC)-1981. Rules are found in Article 89-08 of the North Dakota Administrative Code (1998). Dam safety guidelines are contained in the North Dakota Dam Design Handbook compiled by the State Engineer in June 1985.

Definitions/Dam Classification

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 (ft.)	Hazard Categories		
	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).

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 he deems it 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.

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.

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.

Inspections and any remedial work are to be paid for by the owner. The laws and regulations do not contain information regarding filing fees or bond requirements.

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.

Inspection Process

All inspections are the responsibility of the owners and must be made by "properly trained people".

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.

Violations/Penalties

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).

Emergencies

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).

Liability

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.

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.

OHIO

Citation

Ohio Dam Safety Laws are found in the Ohio Revised Code – (ORC) Title XV (enacted Oct. 10, 1963 and last amended September 1990). Administrative rules enacted by the Division of Water of the Department of Natural Resources supplement the permit and inspection laws 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).

Definitions/Dam Classification

Dams are defined as any artificial barrier together with appurtenant works which either does or may impound water or liquified material. Upground 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]).

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.

Jurisdiction/Powers of Department

Sections 1521.06-064 of the ORC place the authority for implementation of the dam safety laws within the Division of Water of the Department of Natural Resources.

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).

Permit/Approval Process

Before a permit may be issued, two copies of the plans and specifications, including a detailed cost estimate, for the proposed construction, prepared by a registered professional engineer, 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 30 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. One year later, if no evidence of non-compliance is evident, the bond is released (ORC 1521.06). As required by Section 1521.063 of the ORC, the owner is then 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.

Required spillway design standards are found in the Administrative Rules Section 1501:21-13-03 through -05.

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 E).

Inspection Process

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). Section 1521.064 of the ORC provides for the exemption of certain dams from inspection if they meet specific criteria established by the Division of Water. The Rules do not specify any inspection fees to be paid by the owner.

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 (Administrative Rules 1501:21-15-06).

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)

The owner is required to have a licensed, professional engineer perform all inspections (Administrative Rules 1501-21-3-02).

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).

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 Rules do not specify any inspection fees to be paid by the owner.

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.

Emergencies

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.

Liability

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).

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

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. (Administrative Rules 1501:21-19-01).

Other Publications

- *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

Citation

Oklahoma dam safety laws are contained in 82 O.S. § 110, last amended in 1992. Regulations are found in the Oklahoma Water Resources Board Rules, Chapter 25, originally adopted in 1973 and last revised in 1997.

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. No obstruction determined to be designated primarily for road fill shall be considered a dam (Rules 785:25-3-1[6]).

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 potential for hazards (Rules 785:25-3-3).

Size Classification

Size	Maximum Storage (ac-ft)	Maximum Height (ft)
Small	less than 10,000	less than 50
Intermediate	between 10,000 - 50,000	between 50 - 100
Large	greater than 50,000	greater than 100

Hazard Potential Classification

Category	Loss of Life	Economic Loss
Low	none	minimal
Significant	none	appreciable
High	yes	excessive

Jurisdiction/Powers of Department

State dams fall under the jurisdiction of the Oklahoma Water Resources Board, hereafter referred to as "the Board". 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.

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).

The Board has the power to immediately employ remedial measures in the event of a dam emergency (Rules 785:25-9-5).

Permit/Approval Process

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 III305.5).

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

Plans and specifications are to be prepared by a registered professional engineer (Rules 785:25-5-2).

Applicants for a permit must submit an application upon 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 (Rules 785:25-5-1).

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. Protests regarding the application may be heard at this time. The Board will then render its decision (Rules 785:25-5-7).

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. The owner is required to pay all fees and is responsible for any remedial work (Rules 785:25-9-5).

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. 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 found to be unsafe 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.

Owner

Periodic inspections shall be at the owner's expense and shall be conducted by Board staff, a registered professional engineer, or an engineer of any United States governmental agency acting in his official capacity. Some low hazard dams may be exempt from the periodic inspection (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".

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).

Violations/Penalties

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 (Rules 785:25-1-3).

Emergencies

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.

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).

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.

Liability

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 785:25-11-1).

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.

Oversight

As allowed by and subject to compliance with the requirements imposed under the Oklahoma Administrative Procedures Act (75 O.S. 1981, Sections 301326), any interested party may request rehearing, reopening or reconsideration of any final Board action, decision or Order (Rule 785:4-9-3).

Miscellaneous

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).

Citation

Dam safety laws are found in the Oregon Revised Statutes (ORS) 540.350-540.400 enacted 1928, last amended 1985. Regulations are found in the Oregon Administrative Rules (Rules) Chapter 690, Division 20-Water Resources Department, last amended 1994.

Definitions/Dam classification

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, 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, per Rule 690-20-035 (effective 10.03.86).

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.

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; effective 10/03/86.

The owner is required to pay for modifications (ORS 540.360) and for inspections (ORS 540.390).

Inspection Process

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; amended 1981).

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.

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).

Emergencies

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.

Liability

The laws and regulation do not contain provisions for liability on the part of the owner or state.

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).

PENNSYLVANIA

Citation

Dam safety laws are embodied in the Dam Safety and Encroachments Act ("DSE Act")-enacted July 1, 1979 and last amended in 1985. 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")-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 for 2000 or 2001.

Definitions/Dam Classification

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

Class	Impoundment Storage (ac-ft)	Dam Height (ft)
A	50,000 or more	100 or more
B	< 50,000 but > 1000	< 100 but > 40
C	1000 or less	40 or less

Hazard Potential Classification

Category	Loss of Life	Economic Loss
1	substantial	excessive
2	few	appreciable
3	none expected	minimal

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 (DSE Act Section 5).

Rule 105.3 states that the purpose of the regulations is to 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.

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)).

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". 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 per Rule 105.13.

Dam owners are required to first obtain a permit for construction and modification of the dam. A separate application is to be made for the operation and maintenance of the dam (Rule 105.81, 82). 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 are 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.

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 includes, but is not limited to, Class 1 dams as defined in Rule 105.91.

All fees, inspection costs and any remedial work are to be paid for by the owner.

Inspection Process

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).

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.

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. Category 2 dams with no loss of life expected are inspected bi-annually.

Violations/Penalties

Section 18 of the DSE Act makes 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. 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.

Emergencies

The owner of any dam or reservoir that may cause loss of life or serious damage 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 (Rule 105.134).

Liability

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)).

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.

Miscellaneous

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).

Additional Publications:

- *Manual for Inspection, Maintenance, and Operation of Dams in Pennsylvania* - 1997
- *Guidelines for Developing an Emergency Action Plan for High Hazard Dams* - 1997
- *DEP Permit Guide to Dam Permits* - 1998
- *Fact Sheets, various subjects* - 1997

PUERTO RICO

Citation

The Puerto Rico Dam Safety Program is contained in Puerto Rico Law number 133 of July 15, 1986. The Program is run by the Dam Safety Unit of the Puerto Rico Electric Power Authority (PREPA). The Unit is supervised by a committee composed of seven members which are the Executive Director of PREPA (President), the Secretary of the Natural and Environmental Resources, the President of the Puerto Rico Planning Board, the Chief of Operations of the Water Company, and three members of the public sector name by the governor of Puerto Rico.

The Administrative Regulations of the Dam Safety Program can be obtained through the Unit at the following address:

Puerto Rico Electric Power Authority
Dam Safety Unit
PO BOX 364267
San Juan, Puerto Rico 00936-4267

Definitions/Dam Classification

The Law 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 normal water storage elevation of 50 acre-feet or more. All such dams are subject to the provisions of the Law and regulated by the Dam Safety Program.

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.

In addition, dams are assigned a structure classification according to the following criteria:

Low Hazard - Structures for which failure would result in loss of the structure itself, but little or no additional damage to other property.

Intermediate Hazard - Structures for which failure would cause very little loss of life and significant damage to property and project operation,.

High Hazard - Structures for which failure would cause more than very little loss of life and serious damage to communities, industry and agriculture.

Jurisdiction of the Program

The Dam Safety Program is empowered by the Law to exercise the following powers:

- administer and enforce the provisions of the Law
- adopt rules and regulations which have the force and effect of law, for the operation, maintenance and inspection of dams and reservoirs during normal and emergency conditions
- maintain an inventory of dams and reservoirs in Puerto Rico
- inspect all dams and reservoirs in the Program at least every three years in order to determine the safety condition and to recommend measures to correct deficiencies
- review and approve plans and specifications for the construction, modification, repair or removing of dams and reservoirs
- make periodic inspections during construction, modification, repair or removing of dams and reservoirs to ensure compliance with approved plans and specifications
- notify owner of the dam or reservoir when corrective action is necessary
- approve permit after completion of construction, repair or modification

Permit/Approval Process

According to the Law, any dam construction, reconstruction, modification or abandonment in Puerto Rico may only take place if the plans and specifications for such work have been submitted to and approved by the Dam Safety Unit and a permit issued. Exceptions include those projects which are not large enough to require approval in the interest of safety and those over which a federal agency is in charge (Corps of Engineers, Bureau of Reclamation or Conservation of Natural Resources).

All applications for permits shall be in the form and manner prescribed by the Unit. Plans and specifications must be drawn by a licensed professional engineer. Upon receipt of a complete application package. The Unit shall notify the applicant in writing either of approval or denial, or that modifications in the plans or specifications are necessary before the permit can be approved.

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, the Unit will inspect the site to verify compliance with plans and specifications. After construction is finished an impoundment procedure needs to be presented by the owner and followed by the supervision of the Unit.

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

Inspection Process

The Dam Safety Unit conducts a program of regular inspections of all dams and reservoirs every three years. Regulations provide that within three months of completing an on-site inspection of an existing dam, the Unit prepares an inspection report indicating the condition of the dam, the deficiencies observed, if any, that need to be corrected and the time to make the correction. The Unit requires the owner of the dam to conduct monthly inspections.

Non-Compliance/Penalties

The Unit, if it determines that a dam is not in compliance with state dam safety requirements, shall order the owner to take such action as needed to render the dam safe. If the Unit determines that a government-owned dam represents imminent danger to life and property, the Unit will notify the President of the Dam Safety Program Committee who would notify the committee members. With the help of the Office of Budget and Management and the director of the agency who owns the dam, the Committee will adopt a plan to implement the corrective measures and the necessary funds. The Committee will inform the governor of Puerto Rico.

If the Unit determines that a privately-owned dam represents imminent danger to life and property, the Unit will notify the owner by letter of what measures are needed and the time to implement them.

The Law does not provide for penalties.

Liabilities

Puerto Rico Law Number Nine provides legal and monetary assistance to government officials when claims are entered against them when acting according to the Puerto Rico's laws. The officials need to apply for this assistance.

Miscellaneous

Program's Budget

The Puerto Rico Electric Power Authority provides the funds for the Dam Safety Program. At the end of the fiscal year the total cost of the Program is divided by the owners of dams under the Program according to the number of dams. The owners reimburse their share of the cost to the Puerto Rico Electric Power Authority.

RHODE ISLAND

Citation

Dam safety laws are contained in the General Laws of Rhode Island Sections 46-18 and 46-19, dated 1956, as amended. Regulations have not been promulgated since the laws do not give the Department such authority.

Definitions/Dam Classification

Dam, dam height, and hazard classifications definitions are not found in the laws.

Jurisdiction/Powers of Department

The Department of Environmental Management is empowered to make inspections (46-19-1), review and approve plans for construction of dams (46-19-3), order remedial work (46-19-4), and invoke judicial action for non-compliance (46-19-5). 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.

Permit/Approval Process

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 filing fees, construction schedules, spillway design criteria, or requirements for the plans and specifications to be drawn by a licensed professional engineer. Remedial work is paid for by the owner (46-19-4).

Inspections

The Director of the Department shall cause to be made a thorough inspection of every dam and reservoir in the state as often as may be necessary to keep himself informed of the condition thereof (46-19-1). The laws make no mention of the owner's inspection or any frequency thereof.

Owner Non-Compliance/Violations/Penalties

Failure to comply with orders of the Department can result in a complaint being filed with the attorney-general by the Director of the Department. The complaint, along with a petition can be filed with the supreme or superior court, which can issue a citation to the owner commanding him to appear in court. The court may enforce such orders and decrees by injunction, process of contempt, by sequestration, or by such other process as may be applicable in such cases (46-19-5).

Emergencies

The laws make no mention of emergency procedures.

Liability

The liability of a dam owner is set forth in 46-18-2 (Action for Damages from Dam - Liability of Mill and Dam for Recovery)

Oversight

Individuals contesting the orders of the Department will have their cases heard in the supreme or superior court (46-19-5).

SOUTH CAROLINA

Citation

Dam safety laws are found in South Carolina 1976 Code of Laws' Dams and Reservoirs Safety Act 49-11-110; last amended in 1994. Regulations are found in Dams and Reservoirs Safety Act Regulations Section 72-1 through 72-9 published 1997.

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).

Dams are classified by size and hazard potential:

Size Classification

Category	Storage (ac-ft)	Height (ft)
Very small	< 50	< 25
Small	≥ 50 and < 1000	≥ 25 and < 40
Intermediate	≥ 1000 and < 50,000	≥ 40 and < 100
Large	≥ 50,000	≥ 100

Hazard Classification

Class	Hazard Potential
I - High Hazard	Dams located where failure will likely cause loss of life or serious damage
II - Significant Hazard	Dams located where failure will not likely cause loss of life but may damage property
III - Low Hazard	Dams located where failure may cause minimal property damage

Jurisdiction/Powers of Department

The entity with responsibility is the South Carolina Department of Health and Environmental Control ("the Department"). The Department has the power to review plans to construct, repair, alter or remove any dam under its jurisdiction (72-2). The Department has the power to make inspections (72-4), issue permits (72-2), call for remedial work (72-5), cite non-compliance and invoke judicial action (72-4). The Department has the power to take over a dam in the event of an emergency (72-5), and may make rules and regulations for proper administration of the law (49-11-240).

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. Separate applications for permits are required for each of the aforementioned actions. 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 Table I (72-3). Filing fees and costs are not indicated in the laws or regulations. Remedial work is paid for by the owner (72-5).

Inspection Process

The Department makes preliminary inspections within a priority system based on the dam's condition and classification. 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 detailed inspection must be performed by a professional engineer licensed in South Carolina (72-4).

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 (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. Section 49-11-260 of the dam safety statutes provides that violations shall constitute a misdemeanor punishable by fines of not less than \$100 or more than \$500 per day of violation.

Emergencies

The Department has the power to issue immediate orders in the event of an emergency. 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 (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 (72-5). The laws and regulation require Emergency Action Plans for high hazard and significant hazard dams, based on a 1992 change to the law.

Liability

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.

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 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.

SOUTH DAKOTA

Citation

South Dakota dam safety statutes are contained in the South Dakota Codified Laws (SDCL) Chapter 46-7, enacted in 1955 and last amended in 1996. Dam safety regulations are in Administrative Rules of South Dakota (ARSD) Chapter 74:02:08, which became effective in 1986 and were last amended in 1992.

Definitions/Dam Classifications

The term *dam* is defined in ARSD 74:02:08:01 (7) as "an artificial or manmade barrier that is 25 feet or more in height or that may store more than 50 acre-feet of water". 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

Category	Loss of Life Potential	Economic Loss Potential
3	none expected	minimal
2	none expected	appreciable
1	potential loss	extensive

Size Classification

Size	Storage Capacity (acre-feet)	Height (feet)
Small	50 - 1000	25 - 40
Intermediate	1001 - 50,000	41 - 100
Large	greater than 50,000	greater than 100

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.

(See ARSD 74:02:08:03 and :09) The Chief Engineer, according to the provisions of SDCL 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. The statutes (Section 46-7-5.1) 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. Powers in an emergency situation are addressed in SDCL Section 46-7-5.2

Section 78:02:08:09 of the Rules 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. (See SDCL 46-7-3)

Permit/Approval Process

ARSD 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 ARSD 74:02:08:01. 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 ARSD 74:02:08:07.01 through :07.04. Water permit application fees are addressed in SDCL Section 46-2-13.

Inspection Process

ARSD 74:02:08:11 authorizes 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 (SDCL 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. Inspection fees are not assessed by the state.

Section 46-7-3 of the statutes charges the owner of a dam with the responsibility of keeping the works "in good repair at all times" to ensure safety of the works. Additionally, 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.

Owner Non-Compliance/Violations/Penalties

SDCL Sections 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 SDCL 46-1-11.

Emergencies

Emergency procedures are addressed in SDCL 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 (Rules 74:02:08:09 & :10) 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.

Liability

SDCL 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".

Oversight

A hearing process by which owners may contest an order of the Chief Engineer is described in SDCL 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, Section 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.

SDCL 46-7-5.4 through 5.11 provides 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. SDCL 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 in SDCL 46-7-2 to require any appropriator to construct head gates and measuring devices before allowing the diversion of water.
3. Section 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.

TENNESSEE

Citation

The law pertaining to dam safety is the 1973 Safe Dams Act (TCA, Section 69-12-101 through 125), last amended March 1996. Regulations are found in the Rules of the Tennessee Department of Environment and Conservation, Division of Water Supply, Chapter 1200-5-7, effective October 1995.

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" [TCA 69-12-102-(3) and 1200-5-7-.02 (10)]. Diversion weirs, roadbeds, water tanks, and wastewater impoundment barriers as defined are not considered dams.

The regulations go on to define what is not a farm pond.

According to the regulations, dams are classified by size and hazard potential:

Size Classifications

Category	Storage (acre-feet)	Height (ft)
Small	30 - 999	20 - 40
Intermediate	1000 – 50,000	41 - 100
Large	50,000 +	100 +

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 (1200-5-7-.05).

The regulations state that dams will be re-evaluated for hazard potential every 5 years (1200-5-7-.05).

Jurisdiction/Powers of Department

The law gives enforcement authority to the Commissioner of Environment and Conservation through the Division of Water Supply who may exercise the following powers (TCA 69-12-104):

Administer the provisions of this chapter and the provisions of rules and regulations adopted by the commissioner pursuant to this chapter. (Rules and regulations can only be adopted after a public hearing has taken place. Rules establish uniform policies but the law makes note that some rules may apply on a case-by-case basis.)

Conduct or obtain inspections, investigations, research, etc., as deemed necessary to maintain the safety of the construction, operation or maintenance of dams and shall be given right of entry at any time for such purposes plus the right of ingress or egress across intervening properties.

Assess civil penalties for violation of any provision of this chapter or of the rules.

Order remedial work, cite non-compliance and invoke judicial action if necessary.

Examine and approve or disapprove applications for certification to construct, enlarge, repair, alter, maintain, or operate a dam. Suspend or revoke any certificate for any act of failure to comply with these provisions or conditions attached to the certificate. The commissioner may also modify a certificate.

Establish construction, enlargement, maintenance, etc. standards for dams.

Order the immediate cessation of work begun without a certificate of approval.

Issue court actions to obtain enforcement of commissioner's orders.

Hear appeals from orders issued, penalties assessed, or certificates suspended or revoked and administer oaths, issue subpoenas, etc. to carry out the hearing.

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 (TCA 69-12-117).

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 (TCA 69-12-105). 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 (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 (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 an engineer, licensed by the state of Tennessee (TCA 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 (TCA 69-12-110).

The certification is effective for up to 5 years, after that time the applicant must reapply (TCA 69-12-113).

Inspection Process

State

The public safety and welfare requiring it, 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 (Law 69-12-115).

An inspection frequency table is not in the laws or regulations.

Fees

The law establishes two fee structures based on the construction of new dams and the safety inspection of existing dams (TCA 69-12-116). In the law, fee structures are outlined, the regulations designate actual amounts.

Project review fees for construction of new dams to accompany construction certificates (1200-5-7-.09):

Height of Dam	Charge
6 - 30 ft.	\$300
31 - 40 ft.	\$400
41+ ft.	\$500

This fee shall not exceed 1% of total estimated cost of the dam.

Safety inspection fees are required to accompany the application for an operation certificate. The fees are based on hazard potential:

Classification	Charge
HPC 1 (High)	\$250
HPC 2 (Significant)	\$200
HPC 3 (Low)	\$100

All fees collected are earmarked for compliance with the provisions of this law.

No fees are charged for inspection of dams owned by watershed districts (TCA 69-12-116).

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.

Owner Non-Compliance/Violations/Penalties

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 (TCA 69-12-120). 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 (TCA 69-12-121).

The law describes what actions constitute violations and the penalty assessment process in detail (i.e. what action constitutes a violation) (TCA 69-12-117).

Emergencies

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 (Law 69-12-117).

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 (Law 69-12-117).

The regulations require that new dams with a high-hazard potential rating submit emergency action plans to the commissioner. The regulations list what should be included in the EAP (1200-5-7-.10).

Liability

According to the law, the owner is fully responsible and liable for the safety and operation of the dam or reservoir (TCA 69-12-124).

Liability of state personnel is not mentioned in the laws or rules.

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 (TCA 69-12-118).

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 (Law 69-12-120).

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 (TCA 69-12-106).

The law describes the transfer of ownership process and says that multiple dam owners are not required to obtain individual certificates (TCA 69-12-107).

TEXAS

Citation

The Texas dam safety program derives its primary authority from 12.052 of the Texas Water Code (TWC). Regulations are established by the Texas Natural Resource Conservation Commission and are contained in 30 Texas Administrative Code (TAC), Chapter 299, last amended in 1986.

Definitions/Dam Classification

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". (Regulations section 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. (Regulations section 299.1).

Dams are classified by size and hazard potential:

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
Significant	Possible, but not expected	Appreciable
High	Expected	Excessive

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 Code 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).

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 (Regulations section 299.22). A licensed professional engineer registered in Texas must prepare all plans and specifications (Regulations section 299.4). There are no fees for reviewing plans and specifications.

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 storage). Minimum spillway design criteria are required and are found in section 299.14 of the regulations. The owner pays for remedial work (Regulations section 299.28).

Inspection Process

Although not expressly stated in the statutes, regulations sections 299.15(a) and (c) imply that existing dams are evaluated and that these evaluations include visual inspections. 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 (Regulations section 229.24). Inspection of construction work is to be conducted by a registered professional engineer experienced in the construction of dams and responsible directly to the owner (section 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 (section 229.26).

Owner Non-Compliance/Violations/Penalties

Existing dams are covered under sections 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 (299.28). 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 (299.2).

Emergencies

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 (299.61). The regulations do not indicate that the state has the power to take over a dam in the event of an emergency. 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 (299.17).

Liability

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 (299.3).

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

Written approval of the executive director is required for exception from any or all of the regulations. The executive director may grant exception if he determines that the physical conditions involved, when evaluated using standard engineering procedures and techniques, render the requirements unnecessary (See Regulations section 299.5). Additionally, section 299.18 of the regulations allows for the request for a variance from hydrologic criteria in the matter of dam design.

Additional Publications:

- 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.tnrcc.state.tx.us/water/quantity/flood/dam.html>

Citation

Utah's dam safety law is contained in Utah Code Sections 73-5a-101 through 702 which were enacted in 1990 and most recently amended in 1993. The statutes and administrative rules are contained in the "State of Utah Statutes and Administrative Rules for Dam Safety, July 1996".

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.)

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.

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.

Permit/Approval Process

The permit approval process is addressed in section 73-5s-201 through 205 of the Utah Code. 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. 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. Dams for which the submission of plans is not required must be approved according to the provisions of section 73-5a-204. Construction must begin within one year after the date of approval unless an extension has been granted.

Regulations R655-10 through R655-12 explain 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.

Inspection Process

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.

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.

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. He is also responsible for setting minimum maintenance and operating standards for dams, and for implementing a program for the investigation of the state's 25 top priority 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.

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.

Owner Non-Compliance/Violations/Penalties

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.

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.

Emergencies

Section 73-5a-601 requires dam owners 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. 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.

Liability

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".

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.

Oversight

Decisions of the state engineer may be appealed through administrative procedures or judicial action.

Miscellaneous

1. Utah law specifies the qualifications of persons designing dams (73-5a-104), and provides for the hiring of independent consultants if the design, construction or operation warrants an independent review. Section 73-5a-105 allows the state engineer to set the conditions for such a review, determine the requisite qualifications of the consultant, and require the owner to pay all resulting expenses.

R655-10 also addresses the requirement for obtaining a second opinion of critical design topics as part of the approval process.

2. 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.

3. R655-11 covers the procedures involved in the removal of a dam.

VERMONT

Citation

Laws pertaining to Vermont dam and reservoir safety are found in Title 10 of the Vermont Statutes annotated, Chapter 43, Sections 1080-1105, first enacted in 1876 and last amended in 1989. The state has not promulgated rules and regulations relating to dam safety.

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. (See V.S.A. Section 1082) Unsafe dams, according to 10 V.S.A. Section 1095, can be of any size.

The department 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.

Jurisdiction Powers of Department

10 V.S.A. Section 1081 confers the powers and duties authorized by the law to the Department of Environmental Conservation, 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.

The department has specific responsibilities (described in various sections of the statutes) including approval of applications for the construction, enlargement, or alteration of a dam; employment of qualified engineers to review plans and specifications; and initiation of investigations and public hearings on unsafe dams. In addition, the department 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.

Permit/Approval Process

10 V.S.A. Section 1082 requires persons wishing to construct, enlarge, raise, lower, remodel, reconstruct, or otherwise alter any dam to first obtain approval from the department. Section 1083 lists the types of information required as part of the application process, and requires that plans and specifications be prepared under the supervision of a professional registered engineer.

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). A fee of 0.5% of the construction cost with a minimum of \$200.00 must be submitted with the application.

Special provisions governing the construction of agricultural dams are set out in 10 V.S.A. Section 1083a.

Upon the receipt of an application, the department is required to properly notify all persons interested, and may hold a public information meeting on the proposal. Issuance of an order of approval is contingent upon the finding that the proposed project will serve the public good. Conditions and definitions of "public good" are found in Section 1086.

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.

Inspection Process

The inspection of dams program is authorized in 10 V.S.A. Section 1105. The department 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. The department may increase the frequency of such inspections or may make non-routine inspections as warranted. (However, due to limited resources, the Department is unable to meet its inspection goals). A report on the findings and recommendations is provided to the owner upon completion of the inspection. 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.

Owner Non-Compliance/Violations/Penalties

Enforcement of the dam safety provisions is covered in 10 V.S.A. Section 8001 et seq., which deals with the enforcement of various environmental laws.

Emergencies

Procedures for emergency action are described in 10 V.S.A. Section 1095. The department 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. A public hearing may be held, after which the department 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 owner fails to comply with the order within the time limits, the department may petition the courts for enforcement of the order. If the dam presents an imminent danger to human life or property, the department is authorized to take whatever action it considers necessary to protect life and property.

Liability

Under the description of the dam inspection program (10 V.S.A. Section 1105), it is stated that the inspections by the department do not relieve the owner of his legal duties, obligations or liabilities incidental to the ownership or operation of the dam.

Oversight

10 V.S.A. 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 the department. 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

1. According to the provisions of 10 V.S.A. 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 V.S.A. Section 1097, the department 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.

2. 10 V.S.A. 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.

Citation

Virginia's Dam Safety Act is contained in Article 2, Chapter 6, Title 10.1 of the Code of Virginia. The Virginia Soil and Water Conservation Board regulation 4VAC50-20 (formerly VR 625-01-00) entitled "Impounding Structure Regulations" became effective February 1, 1989.

Definitions/Dam Classification

According to Section 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." Exceptions include US dams, agricultural dams which are less than 25 feet in height or which create impoundment smaller than 100 acre-feet, non-agricultural dams which are less than 25 feet in height or which create impoundment smaller than 50 acre-feet and mining dams approved under 45.1-222. 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". These and other definitions are also contained in Part 1, 4VAC50-20-30 of the Virginia dam safety regulations.

4VAC50-20-40 of the regulations describes the size and hazard potential categories into which dams are classified.

These categories range from Class I structures which are located where failure would cause probable loss of life or serious damage to occupied buildings, industrial or commercial facilities, important public utilities, main highways or railroads, to Class IV structures which are located where failure would cause no property damage to others or loss of life. 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.

Jurisdiction/Powers of Department

The Virginia Soil and Water Conservation Board is responsible for the dam safety program in that state, and according to Section 10.1-605 of the statutory Code, 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 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 Sections 10.606 through 10.610)

In addition, Section 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, Sections 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.

Permit/Approval Process

Permitting 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 34VAC50-20-70 (B) of the regulations. 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 34VAC50-20-310 of the regulations. 34VAC50-20-310 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, 34VAC50-20-320 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. Changes from the approved design, plans or construction schedule must be approved by the director. 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 acknowledgment shall serve as a temporary operation and maintenance certificate until one has been applied for and issued in accordance with 34VAC50-20-110 of the regulations.

34VAC50-20-70 (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.

34VAC50-20-80 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.

Operation and Maintenance Certification Process

Part III of the regulations requires owners to obtain operation and maintenance certificates for their impoundment structures. To receive such certificates, owners of newly built dams must submit copies of the reports listed in 34VAC50-20-110, and owners of existing dams must submit copies of the reports listed in 34VAC50-20-120. The issuance or renewal of operation and maintenance certificates is based on the following inspection schedule:

- For newly built structures, within 60 days of the receipt of a certificate of inspection from a professional engineer;

- For existing structures, certificates are for a term of six years, and must be updated based on the filing of re-inspection reports every two years for Class I structures and every three years for Class II structures. Owners of Class I, II, and III dams must apply for the renewal of operation and maintenance certificates every six years, and are required to provide to the director an annual owner's inspection report on official forms in years when no professional re-inspection is required. Class IV impounding structures do not require operation and maintenance certificates, but owners must prepare an inventory report every six years and must file an annual owners inspection report.

Special provisions for the issuance of operation and maintenance certificates for structures built prior to July 1, 1982 are set forth in 34VAC50-20-130 of the regulations.

Inspection Process

State

The Board is authorized by law (section 10.1-607) 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. 34VAC50-20-180 of the regulations requires 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 director is also authorized to make additional inspections during construction, alteration or operation as deemed necessary.

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. (34VAC50-20-180)

Owner Non-Compliance/Violations/Penalties

Section 10.1-613 of the Dam Safety Act, and 34VAC50-20-200 of the regulations 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 section 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. Section 10.1-609 describes the procedures for action in the case of unsafe dams presenting non-imminent danger. (See also 34VAC50-20-220 of the regulations.)

Emergencies

Section 10.1-608 of the statutes and 4VAC50-20-220 of the regulations describes 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. As previously stated, the Governor has the authority to order and take action when the owner fails or refuses to comply in a timely manner.

Emergency action plans are required as part of the design report submitted with applications for construction. (See regulations 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.

Liability

4VAC50-20-20 (A) of the Virginia Dam Safety Regulations states, "This 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".

Nothing is found concerning immunity of state personnel from liability.

Oversight

Section 10.1-609 of the Virginia Dam Safety Act 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 (See section 9-6.14:1)

4VAC50-20-210 of the regulations 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 costs and expenses of such boards are incurred by the party initiating the request.

Miscellaneous

Additional Documents

Please see Virginia Dam Safety Web Site at www.state.va.us/~dcr/

WASHINGTON

Citation

Washington dam safety statutes contained in Chapters 90.03, 43.21A, and 86.16 of the Revised Code of Washington (RCW), last amended in 1994. Rules on dam safety are in Chapter 173-175 of the Washington Administrative Code, last amended in 1992. 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 five basic units:

Part I: General Information and Procedures

Part II: Project Approval

Part III: An Owner's Guidance Manual

Part IV: Dam Design

Part V: Technical Notes

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.

Dam height means the effective hydraulic height of a dam as measured by the vertical distance from the natural bed of the stream or watercourse at the downstream toe of the barrier to the maximum storage elevation.

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.

The hazard classifications used by Washington State are contained in the rules. The *high hazard classification* is for those dams with 3 or more homes at risk, with subcategories of 1C, 1B, and 1A for increasing population at risk. The *significant hazard classification* is for dams with one or two homes at risk, while the low hazard classification is for dams with no lives at risk.

Jurisdiction/Powers of Department

Powers and duties of the Department of Ecology are listed in several sections of the statutes. RCW 86.16.035 gives the Department of Ecology supervision and control over all dams and stream obstructions, and authorizes the making of regulations necessary for the protection of life and property. Under the provisions of RCW 43.21A.064, the Department is responsible for inspection of new construction and modifications and the periodic inspection of existing dams. 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 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.

Permit/Approval Process

Anyone intending to construct or modify a dam or controlling 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) WAC and RCW 90.03.470 requires that fees be collected by the department for the examination of plans and specifications and for subsequent construction inspections before approved plans are returned to the owner. Fee amounts for new construction range from a minimum of \$500 to a maximum of \$20,000, depending on the dam height and crest length of the project. Amounts charged for the review of plans for project modification or remedial work are a percentage of the fees for new construction. See WAC 173-175 for the fee schedule.

Part II of the Dam Safety Guidelines, "Project Approval" 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.

Risk based spillway design criteria are in place and described in Technical Notes 2 & 3 of the Dam Safety Guidelines. Visit the Dam Safety web page to download PDF versions of these documents (<http://www.wa.gov/ecology/wr/dams/guide.html#Guidelines>). The spillway design criteria range from a 500-year flood for small, low hazard dams, up to a 1 in 1,000,000 annual probability flood (or PMP) for large dams with many lives at risk.

Inspection Process

The Department's Dam Safety Section performs periodic construction inspections of dams according to a schedule based on the size and complexity of the project. Inspection fees are based on actual costs and are collected as part of the plan review fee. (RCW 90.03.470 [8]&[9]).

Part II of the Guidelines (Section 3) provides that owners are responsible for routine construction inspections, and outlines the scope of work for such inspection efforts.

Periodic inspections of existing dams are performed by the Department at least every 6 years for high and significant hazard dams, and as needed for low hazard dams. The inspections for high hazard dams are comprehensive, while the significant and low hazard dams receive reconnaissance-level inspections.

Parts II and III of the Guidelines further defines the owner's responsibility for routine maintenance and inspection activities.

Owner Non-Compliance/Violations/Penalties

RCW 90.03.350 provides that 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.

The power to levy civil penalties for violation of statutory provisions, rules, permits, and regulatory orders is granted to the Department in RCW 90.03.60 and RCW 86.16.06. The Department may levy penalties of up to \$1000 per day of violation.

Emergencies

According to rules and executive policy covering actions on emergencies, the Dam Safety Section may take whatever action is needed to protect lives and property. Emergency action plans are required for all high and significant hazard dams.

Liability

The laws and rules do not specifically address owner or departmental liabilities.

Oversight

The procedures of RCW 90.48.144 shall be applicable to all phases of the levying of a penalty as well as review and appeal of the same.

Miscellaneous

Washington's Department of Ecology publishes 7 volumes of Dam Safety Guidelines (<http://www.wa.gov/ecology/wr/dams/guide.html#Guidelines>) dealing with General Information and Procedures, Project Approval, An Owner's Guidance Manual, Dam Design, and 3 Technical Notes dealing with 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

Citation

The West Virginia Dam Control & Safety Act was enacted in 1973 and is contained in Chapter 22-14, Code of West Virginia. The Act was last amended in 1992. Dam Control Regulations are found in Title 47, Series 34 under the Division of Environmental Protection (DEP) regulations, and first became effective in 1982.

Definitions/Dam Classifications

Section 22-14-3 of the Dam Control & Safety Act 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 natural bed of a stream or watercourse at the downstream toe of the barrier.

Section 3.5 of the regulations lists as one of the requirements of the process of application for a certificate of approval the determination of the hazard potential of the proposed 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.

Jurisdiction/Powers of the Department

Responsibility for the dam safety program lies with the West Virginia Department of Environmental Protection. Powers and duties of the department (and its director) are listed in Section 22-14-4 of the Dam Control & Safety Act, and include the following:

- a. To exercise regulatory jurisdiction over dams;
- b. To review applications for certificates of approval, and to grant, modify, amend, revoke, restrict, or deny such certificates;
- c. To adopt, modify, repeal and enforce rules, and to issue orders;
- d. To take any lawful action necessary for the enforcement of the provisions of the statutes;
- e. To establish fees for application review and certificate issuance;
- f. To make any investigation or inspection necessary implement and enforce the law, including the right of entry upon public or private property of any owner; and
- g. To prepare and publish criteria for the design, construction, repair, inspection, and maintenance of jurisdictional dams.

Permit/Approval Process

Section 22-14-5 of the Dam Control & Safety Act requires that persons wishing to place, construct, enlarge, alter, repair, remove or abandon any jurisdictional dam first apply for and receive a certificate of approval from DEP. Applications must be made on forms prescribed by DEP. Section 22-14-6 requires that plans and specifications be in the charge of and sealed by a registered professional engineer. Section 22-14-7 provides that the director must approve or disapprove an application with 60 days of its receipt, and upon approval shall cause notice of the application to be published in a Class I legal advertisement. In accordance with the statute, NRCS dams are not reviewed. Finally, Section 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.

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). Other criteria listed in the regulations are a geotechnical evaluation, stability requirements, special considerations for gravity structures, and instrumentation.

Also contained in the regulations, under 47-34-8, construction of a dam, are parameters for site development and construction, including site preparation and construction requirements. Section 47-34-15 contains rules for operation and maintenance of dams.

Inspection Process

State

The inspection program is authorized under Sections 22-14-9, 22-14-11 and 22-14-4(i) of the Dam Control & Safety Act. DEP conducts construction inspections to assure compliance with approved plans and specifications. While these inspections are carried out by state personnel, any tests or work necessary to provide adequate supervision during construction are done at the owner's expense. 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. In accordance with the statute, state dam safety program inspection of NRCS dams under construction is not permitted.

Owner

Regulations section 47-34-15.4 deals with inspection, specifically the responsibilities of dam owners in this respect. Inspections must be conducted by a registered engineer once every seven days during construction, and after heavy rainfall. Annual inspections of completed dams are required for three years after construction; then high hazard dams are to be inspected at least once every two years. Lower hazard dams have less frequent inspection requirements. Dams with serious problems (as defined in Section 15.5.2) must be inspected as scheduled by Dam Safety Program. According to the provisions of Section 47-34-8 of the regulations, owners must submit written monthly inspection reports to the department during dam construction, and upon the completion of inspections required by Section 47-34-15 for existing dams.

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. In addition, Section 22-14-13 of the statute declares that persons found to be in violation of the law, certificate, or department orders are guilty of a misdemeanor, and may be fined and/or 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 and/or imprisoned. 22-14-15 includes civil penalties of \$200 per day, not to exceed \$400.

Emergencies

Procedures for handling dam emergencies are spelled out in Section 22-14-10 of the Dam Control & Safety Act. Responsibilities of the owner include determining that an emergency exists, notifying DEP 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.

Section 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.

Liability

Section 22-14-12 of the Dam Control & Safety Act provides that "Nothing in this article shall be construed to relieve the owner of a dam of the legal duties, obligations or liabilities incident to the ownership or operation of a dam."

Oversight

Under the provisions of Section 22-14-7 of the statute, persons who may be adversely affected by the issuance of a certificate of approval for a dam are entitled to a hearing thereon before the director of the department. The director, after hearing the evidence presented may either deny the certificate or issue one with terms, conditions and limitations attached.

Section 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. Sections 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.

WISCONSIN

Citation

Wisconsin's dam safety law is found in Wisconsin Statutes Chapter 31, "Regulation of Dams and Bridges Affecting Navigable Waters", enacted in 1971 and last amended in 1984. Regulations are set forth in the Wisconsin Administrative Code Chapter NR 333, "Dam Design and Construction Standards". The regulations were adopted in June 1985, and last amended in April 1987.

Definitions/Dam Classification

Dam is defined in Chapters 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 Chapter 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 lake bed 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".

A preliminary dam hazard rating for all existing dams is determined by the Department of Natural Resources using available data for the regional flood, structural stability of the dam and downstream land use and land use controls. In addition, a hazard rating is required to be included in the hydraulic, hydrologic and stability analysis (plans and specs) required for approval to construct or reconstruct a dam. (See Chapter NR 333.04-05)

Chapter 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.

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.

Jurisdiction/Powers of the Department

According to Chapter 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. Chapter 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 Chapter NR 333.07(4), and ordering public hearings for permit applications.

Permit/Approval Process

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 (Chapter NR 333.07)

Details on these state standards, and procedural guidelines for compliance are provided in Chapter NR 333 of the Wisconsin Administrative Code.

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. (See Chapter 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 Chapter 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. (See Ch. 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. Owners wishing to raise or enlarge dam must apply to the Department for permission and shall furnish the information required by Chapter 31.13.

The Department is authorized by law (Chapter 31.39), to charge permit or approval fees, in the amount of ten dollars, plus an amount ranging from \$50 to \$65 based on the estimated total cost of the project.

Chapter 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 Chapter 31.095.

Chapter 31.185 sets forth procedures for application for permits to abandon or transfer ownership of dams.

Inspection Process

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.

There is no fee schedule in the law or regulations.

Liability

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 (Chapter 31.26). The law expressly protects the state from liability for such damages.

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. Maps of a certain scale showing the land affected by the dam and its flowage are also required by the Department before dam construction can begin.

Citation

The Wyoming Safety of Dams Safety Law (W.S. 41-3-307 through 41-3-318) was enacted in 1977 and was amended in 1992. The State Engineer's Office Regulations and Instructions; Part I, Surface Water, Chapter 5 were adopted in 1913, and last revised in 1974.

Definitions/Dam Classification

Section 41-3-307 of the statutes 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 or 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 in either the laws or the regulations.

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.

Permit/Approval Process

Section 41-3-308 of the Wyoming Statutes is summarized in a brochure distributed by the state engineer's office in the following way: "... duplicate plans and specifications showing the proposed work on any facility, meeting the criteria of the Safety of Dams Law, shall be prepared by or under the direction of a registered professional engineer licensed in Wyoming and experienced in dam design and construction. 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. The term "work" includes the following activities, among others: construction of a new facility and any repair, alteration, or rehabilitation which may affect the safety or size of an existing facility. 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."

Chapter V of the Regulations and Instructions requires that persons wishing to construct a dam or reservoir involving storage or impoundment of water in Wyoming first obtain a permit from the State Engineer. Maps or plans must accompany the permit application, and Section I of Chapter V lists in detail the special requirements for such plans. Requirements for drawings of the dam site, outlet works and spillway are included, along with design criteria for slope ratios, minimum freeboard, and spillway capacity.

Other sections of Chapter V of the Regulations and Instructions give information about the application for various types of reservoir permits.

In addition, surface water right permits are required for any development involving the use of water within the State. The surface water right permits are required under the authority of W.S. 41-201, and procedures for obtaining such permits are described in Part I, Chapter I of the Regulations and Instructions.

Inspection Process

The professional engineer in charge of the construction of (or other work on) the dam is also responsible for periodic inspections during construction and submission of inspection reports to the state engineer. The frequency of these inspections is not specified, but is indicated in W.S. 41-3-309 as "at such intervals as deemed necessary to insure conformity with the approved plans and specifications".

If the state engineer believes the above inspections are not sufficient, W.S. 41-3-310 gives him the authority to personally inspect a dam being constructed or repaired, or he may appoint an assistant to conduct extra inspections. These inspections are conducted at the expense of the state, 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. If the state engineer finds that changes are necessary in order to ensure the safety of the structure, he may order the plans revised and work stopped until such revisions are made.

W.S. 41-3-311 provides for a regular inspection program in which the state, at its own expense, must inspect all dams, reservoirs and diversion systems subject to the statutes at least once every ten years.

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 they are returned to a safe condition by the owner.

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.

Emergencies

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.

Liability

W.S. 41-3-13 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.

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.

Additional Publications:

- Guidelines for Maintenance and Inspection of Dams in Wyoming, 3rd Edition, December 1993, published by the Wyoming State Engineer's Office
- State of Wyoming Dam Safety and Emergency Planning, Wyoming State Engineer's Office and Wyoming Emergency Management Agency. Discusses EAPs and Hazard Classification.
- Wyoming State Engineer's Office 1998 Annual Report is available online at:
<http://seo.state.wy.us/report1998/surface-sod.html>

STATE WEB SITES

Arkansas Soil & Water Conservation Commission: <http://www.state.ar.us/aswcc/>

California Dam Safety <http://damsafety.water.ca.gov/> (Includes links to laws and regulations)

Colorado Division of Water Resources <http://water.state.co.us/default.htm> (Link to laws and regulations)

Florida Dept of Environmental Protection <http://www.dep.state.fl.us> (Direct access to all FL statutes and regulations. Dam safety information to appear Summer 2000)

Georgia Department of Natural Resources <http://www.dnr.state.ga.us/dnr.environ> (Includes rules & law)

Illinois Water Resources <http://dnr.state.il.us/waterresources/index.htm>
(Includes department information, rules and contact e-mail address [dwrn@dnrmail.state.il.us])

Indiana Division of Water <http://www.ai.org/dnr/water>

Indiana Statute <http://www.state.in.us/legislative/ic/code/title14/ar27/ch7.html>

Kansas Water Structures Program <http://www.ink.org/public/kda/water/structures.html>

Kansas State Statutes <http://www.ink.org/>

Kentucky Division of Water Resources <http://water.nr.state.ky.us/wr/dwvr.htm>

Kentucky Laws & Regulations <http://www.lrc.state.ky.us/KRS/151-00/CHAPTER.HTM>
<http://www.lrc.state.ky.us/KAR/TITLE401.HTM>

Louisiana Laws & Regulations <http://www.doa.state.la.us/osr.osr.htm>

Massachusetts Laws and Regulations <http://www.state.ma.us/legis/laws/mgl/gl-253-toc.htm>
<http://www.state.ma.us/dep/matrix.htm>

Michigan Dam Safety Unit http://www.deq.state.mi.us/lwm.water_mgmt/dams/dams.html

Michigan Dam Safety Program Statutes and Rules <http://www.deq.state.mi.us/lwm/lwmacts.htm>

Montana DNRC <http://www.dnrc.state.mt.us/wrd/home.htm> (See Dams and Canals for rules & law)
Government site: <http://www.dnrc.mt.gov/wrd/damrule.htm>

Nebraska Department of Water Resources: <http://www.nol.org/home/DWR>

Nevada Water Resources: <http://ndwr.state.nv.us> (Includes links to statutes and regulations)

Nevada Dam Safety <http://ndwr.state.nv.us/engineering/damsafety.htm>

Nevada Dam Safety Statutes: <http://www.leg.state.nv.us/web/99NRS/NRS-535.html>

New Jersey Dam Safety Section <http://www.state.nj.us/dep/nhr/engineering/damsafety>

New Jersey Laws & Regulations <http://www.state.nj.us/dep/nhr/engineering/damsafety/act.pdf>
<http://www.state.nj.us/dep/nhr/engineering/damsafety/standard.pdf> (regs)

New Mexico State Engineer's Office: <http://www.seo.state.nm.us>

New Mexico Laws and Regulations: <http://www.seo.state.nm.us/publications/dam-criteria/dam-toc.html>

New York Dept of Environmental Conservation <http://www.dec.state.ny.us> (Links to DEC regulations)

New York State laws <http://assembly.state.ny.us/ALIS/laws.html>

State Web Sites

North Carolina Dam Safety Program <http://www.dlr.enr.state.nc.us> (Includes NC Dam Safety Law of 1967 (as amended), the Dam Safety, regulations, application checklist, etc)

North Dakota State Water Commission <http://www.swc.state.nd.us/>

Ohio Division of Water <http://www.dnr.state.oh.us/odnr/water/> (Amended rules available here)

Ohio Laws & Regulations <http://orc.avv.com/title-15/sec-1521/sec-1521.06.htm>
http://onlinedocs.andersonpublishing.com/oac/division-15/chapter-1501_21/home.htm

Oklahoma Water Resources <http://www.state.ok.us/~owrb/> (Rules available here)

Oregon Water Resources Dept. <http://www.wrd.state.or.us> (See Surface Water for information on dams)

Pennsylvania Dam Safety <http://www.dep.state.pa.us/dep/deputate/watermgt/WE/We.htm>

Rhode Island government info: <http://www.info.state.ri.us/>

South Carolina Dept of Health & Environmental Control
<http://www.state.sc.us/dhec/eqc/water/html/drsmainpage.html> (Includes link to state dam safety laws and regulations)

South Dakota Dept of Environment & Natural Resources <http://www.state.sd.us/denr/wr>

Tennessee Safe Dams Section <http://www.state.tn.us/environment>

Texas Dam Safety <http://www.tnrcc.state.tx.us/water/quantity/flood/dam.html>
(Includes links to statutes and rules)

Utah Division of Water Rights <http://nrwr1.nr.state.ut.us/>

Utah Dam Safety <http://nrwr1.nr.state.ut.us/daminfo/default.htm>
(Includes comprehensive inventory, statutes and rules)

Utah Dam Database Web Page <http://nrwr1.nr.state.ut.us/daminfo/default.htm>

Virginia Dam Safety <http://www.state.va.us/~dcr/sw/damsafty.htm>

Virginia State Regs. site: <http://www.state.va.us/~dcr/lawregs.htm>

Washington Dam Safety <http://www.wa.gov/ecology/wr/dams/dss.html>

Washington Rules and Regulations http://www.wa.gov/ecology/wr/dams/guidelines_part_1.pdf

West Virginia Dam Control and Safety Act <http://www.legis.state.wv.us/>
(See WV Code, State Code, Article §22-14-1)

West Virginia Dam Safety Regulations <http://www.state.wv.us/csr/>
(Search by title – not series – number.)

Wisconsin Dam Safety <http://www.dnr.state.wi.us/org/water/wm/dsfm/index.htm>
(Fact sheets, links to laws/regs from www.dnr.state.wi.us)

Wisconsin Administrative Code <http://www.legis.state.wi.us/rsb/code/nr/nr333.pdf>

State Citations

STATE	STATUTE (Last Amended)	REGULATIONS (Last Amended)
Alabama	No dam safety legislation	
Alaska	AS Title 46 Chapter 17 (May 31, 1987)	AAC Chapter 93 Section 150.201 (August 16, 1989)
Arizona	ARS Title 45 Ch 6 Art I ARS 45: 1201-1223 (2000)	Chapter 15, R12-15-151 and 152-15-1201- 1226 (2000)
Arkansas	Section 15-22-201 through 15-22-222	Rules & Regulations Governing the Arkansas Dam Safety Program (1993)
California	California Water Code Section 6000-6501 (1995)	California Code of Regulations Title 23 Div. 2, Sect. 301-333
Colorado	37-87-101, Article 87 (1990)	Sept. 1988
Connecticut	CGS Sections 22a-401 thru 411 (June 1998)	22a-409-1 thru 409.2 (Nov 1985)
Delaware	Del. C.23 Chapt. 19 1901-1904	N/A
Florida	Chapt. 373 Part IV, Sect. 373.403 thru 4596 Management & Storage of Surface Waters (1989)	17-41.01 (May 1983)
Georgia	Safe Dams Act of 1978 OCGA 12-5-370 thru 12-5-385 (1990)	Chapt. 391-3-8 (October 1998)
Hawaii	HRS S.179D: Dams & Reservoirs (1987)	Rules Title 13, Dept. of Land & Natural Resources, Subtitle 7, Water & Land Development, Ch. 190 Dams & Reservoirs 190-1 thru 190-42 (May 1990)
Idaho	Safety of Dams Statutes, Title 42, Ch. 17	IDAPA 37, Title 03, Ch. 6 (July 1988)
Illinois	615 ILCS5 (Feb. 7, 1996)	Title 17, Ch. I, Subchapter h (April 10, 1998)
Indiana	I.C. Chapt. 14-27-7 and 14-28-1 (1995)	None
Iowa	Ch. 455B, Div. III, Part 4 (1986)	Ch. 70-75, Title V (1994)
Kansas	KSA 82a-301-305a (April 1978)	KAR 5-40-1 – 5-40-9 (May 1, 1987), EG-1 (1986), EG-2 (1985)
Kentucky	KRS Chapt. 151 (1990)	KAR Chapt. 4, Title 401 (1975)

State Citations

Louisiana	LARS 38: 21-28 (1993)	Dam Safety Rules and Regulations (December 20, 1996)
Maine	MRS Title 37-B Sections 1051-1071, Ch. 21-22 (1999); Title 38 Article 3-A, Sections 815-843; Title 38, Ch. 5, Subchapt 1, Sections 611-933 (1989)	Chapter 3: Design and Construction Standards for New or Reconstructed Dams (July 1990 – revision in progress)
Maryland	Environmental Article S.5-203, 5-501 thru 514, Annotated Code of Maryland (1995)	Code of MD Regulations, Title 26, Dept. of Environment, Subtitle 17, Chapt. 04
Massachusetts	MA Gen Laws Ch 253, Sect 44-52 (1985)	CMR 302 10.00-10.17 (Dec., 1996)
Michigan	Part 315, Natural Resources and Environmental Protection Act, Act 451, Public Acts of 1994, As Amended (1995), 324.31501 through 324.31529	(Draft rules have been promulgated.)
Minnesota	Ch. 779 & Ch 105 (1979)	Public Water Resources Rules 6115.0010 - 6115.0810
Mississippi	51-3-1 thru 51-3-55 (1972)	Surface Water & Groundwater Use & Protection Regs., Section VII (1994)
Missouri	RSMo Ch. 236.400 thru 236.500 (1993)	10 CSR 22-1.010 thru 10 CSR 22-4.020 (1990)
Montana	85-15-101 thru 503 (1993)	DNR & Conservation Title 36, Chapter 25 (1988)
Nebraska	Chapter 46-277, Article 2 (1995)	Title 457 (1995)
Nevada	NRS Chapt. 535 (1993)	N/A
New Hampshire	RSA Chapt. 482 (1998)	NH Code of Administrative Rules, Ch. ENV-WR100-800 (1997)
New Jersey	NJRS Title 58: Chapter 4 (1981)	NJAC 7:20-1.1 (2000)
New Mexico	Chapter 72 (1997)	Use of Surface Water Rules & Regs (1987)
New York	ECL Art 15, Title 5 (July 1999)	NYCRR Title 6 Parts 608 and 673 (1994, 1986 – revisions in progress)
North Carolina	143-215-23 (1995)	Title 15A-2K (1995)
North Dakota	ND Century Code Section 61-01-05 (1987)	ND Dam Design Handbook (1985) and NDAC Article 89-08 (1998)

Ohio	ORC Title XV (Sept 1990)	OAR Chapter 13 (Dec 1999)
Oklahoma	82 O.S. § 110, (1992)	OK Water Resources Board Rules, Chapter 25 (1997)
Oregon	ORS 540.350-540.400 (1985)	OAR Chapt. 690, Div. 20 (1994)
Pennsylvania	Dam Safety & Encroachments Act of 1979, PL 1375, No. 325 (1985)	Title 25, Part I, Subch. C, Art. II, Ch. 105 (1991 – revision in progress)
Puerto Rico	Puerto Rico Law 133 (July 15, 1986)	Last amended March 26, 1996
Rhode Island	Sections 46-18 and 46-19 (1956)	N/A
South Carolina	Act 49-11-110 (1994)	Dams & Reservoirs Safety Act Regulations Sect. 72-1 thru 72-9 (1997)
South Dakota	SDCL Ch. 46-7 (1996)	ARSD Ch 74:02:08 (1992)
Tennessee	Safe Dams Act of 1973, TCA Section 69-12-101 thru 69-12-125 (March 1996)	Dept of Env. & Conservation, Div. of Water Supply, Ch. 1200-5-7 (Oct 1995)
Texas	Texas Water Code 12.052 (1991)	30 Texas Administration Code (TAC), Chapter 299 (1986)
Utah	Utah Code Sections 73-5a-101 thru 702 (1993)	Statutes & Adm. Rules for Dam Safety (July 1996)
Vermont	Title 10 VSA Ch 43; 1080-1105 (1989)	N/A
Virginia	Article 2, Ch. 6, Title 10.1	34-VAC 50-20
Washington	Chapter 90.03, 43.21A & 86.16 RCW (1994)	Chapter 173-175 WAC (1992) and Dept. of Ecology Dam Safety Guidelines
West Virginia	Dam Control & Safety Act Ch. 22-14 (1992)	DEP Title 47 Series 34
Wisconsin	Chapter 31 (1984)	WAC Chapter NR 333 (April 1987)
Wyoming	WS 41-3-307 thru 318 (1992)	State Engineer's Office Regulations & Instructions, Part I, Surface Water, Chapter 5 (1974)