IMPOUNDING STRUCTURE REGULATIONS

4VAC50-20-30. Definitions.

The following words and terms, when used in this chapter, shall have the following meanings, unless the context clearly indicates otherwise:

"Acre-foot" means a unit of volume equal to 43,560 cubic feet or 325,853 gallons (one foot of depth over one acre of area).

"Agricultural purpose dams" means dams which are less than 25 feet in height or which create a maximum impoundment smaller than 100 acre-feet and certified by the owner on official forms as constructed, maintained or operated primarily for agricultural purposes.

"Alteration permit" means a permit required for changes to an impounding structure that could alter or affect its structural integrity. Alterations requiring a permit include, but are not limited to: changing the height, increasing the normal pool or principal spillway elevation, changing the elevation or physical dimensions of the emergency spillway or removing the impounding structure.

"Board" means the Virginia Soil and Water Conservation Board.

"Conditional operation and maintenance certificate" means a certificate required for impounding structures with deficiencies.

"Construction permit" means a permit required for the construction of a new impounding structure.

"Design flood" means the calculated volume of runoff and the resulting peak discharge utilized in the evaluation, design, construction, operation and maintenance of the impounding structure.

"Design freeboard" means the vertical distance between the maximum elevation of the design flood and the top of the impounding structure.

"Director" means the Director of the Department of Conservation and ~~Historic Resources~~ Recreation or his designee.

"Height" means the structural height of an impounding structure. If the impounding structure spans a stream or watercourse, height means the vertical distance from the natural bed of the stream or watercourse measured at the downstream toe of the impounding structure to the top of the impounding structure. If the impounding structure does not span a stream or watercourse, height means the vertical distance from the lowest elevation of the outside limit of the barrier to the top of the impounding structure.

~~"Impounding structure" means a manmade device, whether a dam across a watercourse or other structure outside a watercourse, used or to be used to retain or store waters or other materials. The term "impounding structure" includes all dams which are equal to or greater than 25 feet in height and which create a maximum impoundment equal to or greater than 50 acre-feet, except (i) dams licensed by the State Corporation Commission that are subject to a dam safety inspection program; (ii) dams owned or licensed by the United States government; (iii) dams constructed, maintained or operated primarily for agricultural purposes which are less than 25 feet in height or which create a maximum impoundment smaller than 100 acre-feet; (iv) water or silt retaining dams approved pursuant to §45.1-222 of the Code of Virginia; or (v) obstructions in a canal used to raise or lower water levels.~~

"Impounding structure" means a man-made device, whether a dam across a watercourse or other structure outside a watercourse, used or to be used to retain or store waters or other materials. The term includes: (i) all dams that are twenty-five feet or greater in height and that create an impoundment capacity of fifteen acre-feet or greater, and (ii) all dams that are six feet or greater in height and that create an impoundment capacity of fifty acre-feet or greater. The term "impounding structure" shall not include: (a) dams licensed by the State Corporation Commission that are subject to a safety inspection program; (b) dams owned or licensed by the United States government; (c) dams constructed, maintained or operated primarily for agricultural purposes which are less than twenty-five feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet; (d) water or silt retaining dams approved pursuant to § 45.1-222 or § 45.1-225.1; or (e) obstructions in a canal used to raise or lower water.

"Impoundment" means a body of water or other materials the storage of which is caused by any impounding structure.

"Inundation zone" means an area that could be inundated as a result of impounding structure failure and that would not otherwise be inundated to that elevation.

"Life of the impounding structure" and "life of the project" mean that period of time for which the impounding structure is designed and planned to perform effectively, including the time required to remove the structure when it is no longer capable of functioning as planned and designed.

"Maximum impounding capacity" means the volume in acre-feet that is capable of being impounded at the top of the impounding structure.

"Normal impounding capacity" means the volume in acre-feet that is capable of being impounded at the elevation of the crest of the lowest ungated outlet from the impoundment.

"Operation and maintenance certificate" means a certificate required for the operation and maintenance of all impounding structures.

"Owner" means the owner of the land on which an impounding structure is situated, the holder of an easement permitting the construction of an impounding structure and any person or entity agreeing to maintain an impounding structure. The term "owner" includes the Commonwealth or any of its political subdivisions, including but not limited to sanitation district commissions and authorities. Also included are any public or private institutions, corporations, associations, firms or companies organized or existing under the laws of this Commonwealth or any other state or country, as well as any person or group of persons acting individually or as a group.

"Top of the impounding structure" means the lowest point of the nonoverflow section of the impounding structure.

"Watercourse" means a natural channel having a well-defined bed and banks and in which water flows when it normally does flow.

4VAC50-20-50. Performance standards required for impounding structures.

Impounding structures shall be constructed, operated and maintained such that they perform in accordance with their design and purpose throughout the life of the project. For new impounding structures, the spillway(s) capacity shall perform at a minimum to safely pass the appropriate spillway design flood as determined in Table 1.

TABLE I - Impounding Structure Regulations

Class of Dam	Hazard Potential If Impounding Structure Fails	SIZE CLASSIFICATION		Spillway Design Flood (SDF)[b]
		Maximum Capacity (Ac-Ft)[a]	Height(Ft)[a]	
I	Probable Loss of Life; Excessive Economic Loss	Large ≥ 50,000	≥ 100	PMF[c]
		Medium ≥ 1,000 & <50,000	≥ 40 & < 100	PMF
		Small ≥ 50 & < 1,000	≥ 25 & < 40	1/2 PMF to PMF
II	Possible Loss of Life; Appreciable Economic Loss	Large ≥ 50,000	≥ 100	PMF
		Medium ≥ 1,000 & <50,000	≥ 40 & < 100	1/2 PMF to PMF
		Small ≥ 50 & < 1,000	≥ 25 & < 40	100-YR to 1/2 PMF
III	No Loss of Life Expected; Minimal Economic Loss	Large ≥ 50,000	≥ 100	1/2 PMF to PMF
		Medium ≥ 1,000 & <50,000	≥ 40 & < 100	100-YR to 1/2 PMF
		Small ≥ 50 & < 1,000	≥ 25 & < 40	50-YR[d] to 100-YR[e]
IV	No Loss of Life Expected; No Economic Loss to Others	≥ 50 (non-agricultural)	≥ 25 (both)	50-YR to 100-YR
		≥ 100 (agricultural)		

a. The factor determining the largest size classification shall govern.

b. The spillway design flood (SDF) represents the largest flood that need be considered in the evaluation of the performance for a given project. The impounding structure shall perform so as to safely pass the appropriate SDF. Where a range of SDF is indicated, the magnitude that most closely relates to the involved risk should be selected. The establishment in this chapter of rigid design flood criteria or standards is not intended. Safety must be evaluated in the light of peculiarities and local conditions for each impounding structure and in recognition of the many factors involved, some of which may not be precisely known. Such can only be done by competent, experienced engineering judgment, which the values in Table 1 are intended to supplement, not supplant.

c. PMF: Probable maximum flood. This means the flood that might be expected from the most severe combination of critical meteorologic and hydrologic conditions that are reasonably possible in the region. The PMF is derived from the current probable maximum precipitation (PMP) available from the National Weather Service, NOAA. In some cases local topography or meteorological conditions will cause changes from the generalized PMP values; therefore, it is advisable to contact local, state or federal agencies to obtain the prevailing practice in specific cases.

d. 50-Yr: 50-year flood. This means the flood magnitude expected to be equaled or exceeded on the average of once in 50 years. It may also be expressed as an exceedence probability with a 2.0% chance of being equaled or exceeded in any given year.

e. 100-Yr: 100-year flood. This means the flood magnitude expected to be equaled or exceeded on the average of once in 100 years. It may also be expressed as an exceedence probability with a 1.0% chance of being equaled or exceeded in any given year.

4VAC50-20-70. Construction permits.

A. Prior to preparing the complete design report for a construction permit, applicants are encouraged to seek approval of the project concept from the director. For this purpose the applicant should submit a general description of items 1 through 4 of subsection B and items 1 and 2 below:

1. Proposed design criteria and a description of the size, ground cover conditions, extent of development of the watershed and the geologic and the geotechnical engineering assumptions used to determine the foundations and materials to be used.

2. Preliminary drawings of a general nature, including cross sections, plans and profiles of the impounding structure, proposed pool levels and types of spillway(s).

B. An applicant for a construction permit shall submit a design report on official forms. The design report shall be prepared in accordance with 4VAC50-20-240 of this chapter and shall include the following information:

1. A description of the impounding structure and appurtenances and a proposed classification conforming with this chapter. The description shall include a statement of the purposes for which the impoundment and impounding structure are to be used.

2. A description of properties located in the inundation zone downstream from the site of the proposed impounding structure, including the location and number of residential structures, buildings, roads, utilities and other property that would be endangered should the impounding structure fail.

3. A statement from the governing body of the local political subdivision or other evidence confirming that body is aware of the proposal to build an impounding structure and of the land use classifications applicable to the inundation zone.

4. Maps showing the location of the proposed impounding structure that include: the county or city in which the proposed impounding structure would be located, the location of roads, access to the site and the outline of the impoundment. Existing aerial photographs or existing topographic maps may be used for this purpose.

5. A report of the geotechnical investigations of the foundation soils or bedrock and of the materials to be used to construct the impounding structure.

6. Design assumptions and analyses sufficient to indicate that the impounding structure will be stable during its construction and during the life of the impounding structure under all conditions of reservoir operations, including rapid filling and rapid drawdown of the impoundment.

7. Evaluation of the stability of the reservoir rim area in order to safeguard against reservoir rim slides of such magnitude as to create waves capable of overtopping the impounding structure and confirmation of rim stability during seismic activity.

8. Design assumptions and analyses sufficient to indicate that seepage in, around, through or under the impounding structure, foundation and abutments will be reasonably and practically

controlled so that internal or external forces or results thereof will not endanger the stability of the impounding structure.

9. Calculations and assumptions relative to design of the spillway or spillways. Spillway capacity shall conform to the criteria of Table 1.

10. Provisions to ensure that the impounding structure and appurtenances will be protected against deterioration or erosion due to freezing and thawing, wind and rain or any combination thereof.

11. Other pertinent design data, assumptions and analyses commensurate with the nature of the particular impounding structure and specific site conditions, including when required by the director, a plan and profile of the inundation zones.

12. Erosion and sediment control plans to minimize soil erosion and sedimentation during all phases of construction, operation and maintenance. Projects shall be in compliance with local erosion and sediment control ordinances.

13. A description of the techniques to be used to divert stream flow during construction so as to prevent hazard to life, health and property.

14. A plan of quality control testing to confirm that construction materials and methods meet the design requirements set forth in the specifications.

15. A proposed schedule indicating construction sequence and time to completion.

16. Plans and specifications as required by 4VAC50- 20-310 of this chapter.

17. An emergency action plan on official forms and evidence that a copy of such plan has been filed with the local organization for emergency management and ~~state~~ State Department of

Emergency ~~Services~~ Management. The plan shall include a method of providing notification and warning to persons downstream, other affected persons or property owners and local authorities in the event of a flood hazard or the impending failure of the impounding structure.

18. A proposed impoundment and impounding structure operation and maintenance plan on official forms certified by a professional engineer. This plan shall include a safety inspection schedule and shall place particular emphasis on operating and maintaining the impounding structure in keeping with the project design, so as to maintain its structural integrity and safety during both normal and abnormal conditions which may reasonably be expected to occur during its planned life.

C. The director or the applicant may request a conference to facilitate review of the applicant's proposal.

D. The owner shall certify in writing that the operation and maintenance plan as approved by the board will be adhered to during the life of the project except in cases of unanticipated emergency requiring departure therefrom in order to mitigate hazard to life and property. At such time, the owner's engineer and the director shall be notified.

E. If the submission is not acceptable, the director shall inform the applicant within 60 days and shall explain what changes are required for an acceptable submission.

F. Within 120 days of receipt of an acceptable design report the board shall act on the application.

G. Prior to and during construction the owner shall notify the director of any proposed changes from the approved design, plans, specifications, or operation and maintenance plan. Approval

shall be obtained from the director prior to the construction or installation of any changes that will affect the stability of the impounding structure.

H. The construction permit shall be valid for the construction schedule specified in the approved design report. The construction schedule may be amended by the director for good cause at the request of the applicant.

I. Construction must commence within two years after the permit is issued. If construction does not commence within two years after the permit is issued, the permit shall expire, except that the applicant may petition the board for extension of the two-year period and the board may extend such period for good cause.

J. The director may revoke a construction permit if any of the permit terms are violated, or if construction is conducted in a manner hazardous to downstream life or property. The director may order the owner to eliminate such hazardous conditions within a period of time limited by the order. Such corrective measures shall be at the owner's expense. The applicant may petition the board to reissue the permit with such modifications as the board determines to be necessary.

K. The owner's professional engineer shall advise the director when the impounding structure may safely impound water. The director shall acknowledge this statement within 10 days after which the impoundment may be filled under the engineer's supervision. The director's acknowledgement shall act as a temporary operation and maintenance certificate until an operation and maintenance certificate has been applied for and issued in accordance with 4VAC50-20-110 of this chapter.

4VAC50-20-120. Operation and maintenance certificates for existing impounding structures.

A. Any owner of an impounding structure other than a Class IV impounding structure which has already filed an inventory report that does not have an operation and maintenance certificate or any owner renewing an operation and maintenance certificate shall file an application with the board.

B. The application for an operation and maintenance certificate shall be on official forms and shall include:

1. A reinspection report for Class I and II impounding structures. The reinspection report shall include an update of conditions of the impounding structure based on a ~~Phase I or Phase II~~ previous safety inspection as ~~established by the U.S. Army Corps of Engineers~~ required by the board, a previous reinspection report or an as-built report.

2. An inventory report for Class III impounding structures. The inventory report shall include:

a. The name and location of the impounding structure and the name of the owner.

b. The description and dimensions of the impounding structure, the spillways, the reservoir and the drainage area.

c. The history of the impounding structure which shall include the design, construction, repairs, inspections and whether the structure has been overtopped.

d. Observations of the condition of the impounding structure, reservoir, and upstream and downstream areas.

e. Any changes in the impounding structure, reservoir, and upstream and downstream areas.

f. Recommendations for remedial work.

3. An impoundment and impounding structure operation and maintenance plan certified by a professional engineer. This plan shall place particular emphasis on operating and maintaining the impounding structure in keeping with the project design in such manner as to maintain its structural integrity and safety during both normal and abnormal conditions which may reasonably be expected to occur during its planned life. The ~~Phase I Inspection Report~~ safety inspection report required by the board should be sufficient to serve as the basis for the operation and maintenance plan for a Class I and Class II impounding structure. For a Class III impounding structure, the operation and maintenance plan shall be based on the data provided in the inventory report.

4. An emergency action plan and evidence that a copy of such plan has been filed with the local organization for emergency management and ~~state~~ State Department of Emergency ~~Services~~ Management. The plan shall include a method of providing notification and warning to persons downstream, other affected persons or property owners and local authorities in the event of a flood hazard or the impending failure of the impounding structure.

C. The owner shall certify in writing that the operation and maintenance plan approved by the board will be adhered to during the life of the project except in cases of emergency requiring departure therefrom in order to mitigate hazard to life and property, at which time the owner's engineer and the director shall be notified.

D. If the director finds that the operation and maintenance plan or emergency action plan is deficient, he shall return it to the owner within 60 days with suggestions for revision.

E. Within 60 days of receipt of an acceptable application if the board finds that adequate provision has been made for the safe operation and maintenance of the impounding structure, the board shall issue an operation and maintenance certificate.

4VAC50-20-220. Unsafe conditions.

A. No owner shall have the right to maintain an impounding structure which unreasonably threatens the life or property of another person. The owner of any impounding structure found to have deficiencies which could threaten life or property if uncorrected shall take the corrective actions needed to remove such deficiencies within a reasonable period of time.

B. Imminent danger.

When the director finds that an impounding structure is unsafe and constitutes an imminent danger to life or property, he shall immediately notify the ~~state~~ State Department of Emergency ~~Services~~ Management and confer with the owner. The owner of an impounding structure found to constitute an imminent danger to life or property shall take immediate corrective action to remove the imminent danger as required by §10.1-608 of the Code of Virginia.

C. Nonimminent danger.

The owner of an impounding structure who has been issued a report by the ~~director~~ board containing findings and recommendations for the correction of deficiencies which threaten life or property if not corrected, shall undertake to implement the recommendations for correction of deficiencies according to a schedule of implementation contained in that report as required by §10.1-609 of the Code of Virginia.

4VAC50-20-320. Acceptable design procedures and references.

The following are acceptable as design procedures and references:

1. The design procedures, manuals and criteria used by the United States Army Corps of Engineers.

2. The design procedures, manuals and criteria used by the United States Department of Agriculture, ~~Soil Conservation Service~~ Natural Resources Conservation Service.

3. The design procedures, manuals and criteria used by the United States Department ~~or~~ of Interior, Bureau of Reclamation.

4. The design procedures, manuals and criteria used by the United States Department of Commerce, National Weather Service.

5. Other design procedures, manuals and criteria that are accepted as current, sound engineering practices, as approved by the director prior to the design of the impounding structure.

DAM SAFETY PROGRAM FORMS

~~Dam Safety Program –~~ Dam Owner's Annual Inspection Form (DCR 199-098) (12/01)

~~Dam Safety Program –~~ Operation and Maintenance Application Class I, II and III Impounding Structures (DCR 199-099) (12/01)

~~Dam Safety Program –~~ As-Built Report for Class I, II and III Impounding Structures (DCR 199-100) (12/01)

~~Dam Safety Program –~~ Design Report for the Construction/Alteration of Impounding Structures (DCR 199-101) (12/01)

~~Dam Safety Program –~~ Emergency Action Plan for Class I, Class II and Class III Impounding Structures (DCR 199-103) (12/01)

~~Dam Safety Program –~~ Inventory Report for Class III and Class IV Impounding Structures (DCR 199-104) (12/01)

~~Dam Safety Program –~~ Reinspection Report for Class I and II Impounding Structures (DCR 199-105) (12/01)

~~Dam Safety Program –~~ Agricultural Certification for Impounding Structures (DCR 199-106) (12/01)

~~Dam Safety Program –~~ Transfer Application for Impounding Structures (DCR 199-107) (12/01)