



## Final Regulation Agency Background Document

<b>Agency name</b>	Virginia Soil and Water Conservation Board
<b>Virginia Administrative Code (VAC) citation</b>	4 VAC 50-20
<b>Regulation title</b>	Impounding Structure Regulations
<b>Action title</b>	Amend, modify, or delete provisions of Virginia's Impounding Structure Regulations to enhance the Dam Safety Program and to improve public safety.
<b>Date this document prepared</b>	April 7, 2008

This information is required for executive branch review and the Virginia Registrar of Regulations, pursuant to the Virginia Administrative Process Act (APA), Executive Orders 36 (2006) and 58 (1999), and the *Virginia Register Form, Style, and Procedure Manual*.

### Brief summary

*Please provide a brief summary (no more than 2 short paragraphs) of the proposed new regulation, proposed amendments to the existing regulation, or the regulation proposed to be repealed. Alert the reader to all substantive matters or changes. If applicable, generally describe the existing regulation. Also, please include a brief description of changes to the regulation from publication of the proposed regulation to the final regulation.*

This regulatory action amends the Virginia Soil and Water Conservation Board's Impounding Structure Regulations and is being advanced to protect the safety and welfare of the public and their property from the impact of dam failures. The key elements of this final regulation will:

- 1) Revise the dam hazard potential classification system [Change the dam classification system from four categories (Class I, II, III, and IV) to three hazard classifications (High, Significant, and Low)];
- 2) Specify that spillway design requirements are applicable to all state regulated dams [Table 1 of the regulations will now apply to all dams regardless of the date they were built];
- 3) Modify the spillway design requirements to enhance public safety and reduce subjectivity. [The final regulations further refined and simplified the requirements of

Table 1 as well as created “special criteria” for certain low hazard impounding structures, resulting in a 57% reduction in estimated potential spillway upgrade costs for regulated dams from the proposed regulations to the final regulations];

- 4) Allow for the potential reduction of the spillway design flood requirements through incremental damage assessments for all qualifying dams;
- 5) Establish dam break inundation zone mapping requirements in order to identify areas that will be subject to flooding during a dam failure;
- 6) Expand emergency action plan requirements for High and Significant Hazard Potential dams and emergency preparedness plan requirements for Low Hazard Potential dams in order to enhance public safety and public awareness;
- 7) Establish permit application fees for the administration of the Dam Safety Program. [In the final regulations the application fees were reduced from those set out in the proposed regulations. Construction remained the same but Regular O&M, Conditional O&M, and Incremental Damage Assessment fees were reduced or eliminated. This resulted in an overall annual reduction in revenue from fees of approximately 60%];
- 8) Remove the forms that are incorporated by reference and move reporting standards into the regulations;
- 9) Create new definitions or modify current definitions;
- 10) Reorganize, clarify, and expand sections related to permitting procedures; and
- 11) Update sections related to inspections, enforcement, and unsafe conditions.

NOTE: The following is a listing of acronyms frequently used within this document:

- DCR – Virginia Department of Conservation and Recreation
- EAP – Emergency Action Plan
- SDF – Spillway Design Flood
- PMF – Probable Maximum Flood
- TAC – Technical Advisory Committee
- NOIRA – Notice of Intended Regulatory Action
- FEMA – Federal Emergency Management Agency
- Additionally, the terms “dam” and “impounding structure” may be used interchangeably.

**Statement of final agency action**

*Please provide a statement of the final action taken by the agency including (1) the date the action was taken, (2) the name of the agency taking the action, and (3) the title of the regulation.*

This action to amend and adopt final regulations 4 VAC 50-20, Impounding Structure Regulations was unanimously approved by the Virginia Soil and Water Conservation Board on February 1, 2008.

**Legal basis**

*Please identify the state and/or federal legal authority to promulgate this proposed regulation, including (1) the most relevant law and/or regulation, including Code of Virginia citation and General Assembly*

chapter numbers, if applicable, and (2) promulgating entity, i.e., agency, board, or person. Describe the legal authority and the extent to which the authority is mandatory or discretionary.

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The Virginia Dam Safety Act (§10.1-604 through §10.1-613 of the Code of Virginia) ensures public safety through the proper and safe design, construction, operation, and maintenance of impounding structures in the Commonwealth. This is accomplished through the effective administration of the Virginia Dam Safety Program (Program). Authority for the Program rests with the Virginia Soil and Water Conservation Board (Board) and it is administered on behalf of the Board by the Department of Conservation and Recreation's Division of Dam Safety and Floodplain Management. The Program focuses on enhancing public safety through bringing all impounding structures of regulated size under Regular Operation and Maintenance Certificates.

Pursuant to §10.1-605, the Board is directed to promulgate regulations for impounding structures:

*§10.1-605 The Board shall promulgate regulations to ensure that impounding structures in the Commonwealth are properly and safely constructed, maintained and operated.*

Further, the Board reserves the sole right to promulgate regulations:

*§10.1-605.1. Delegation of powers and duties. - The Board may delegate to the Director or his designee any of the powers and duties vested in the Board by this article, except the adoption and promulgation of regulations or the issuance of certificates. Delegation shall not remove from the Board authority to enforce the provisions of this article.*

These regulations, entitled the Impounding Structure Regulations (4 VAC 50-20-10 et seq.), were first promulgated by the Virginia Soil and Water Conservation Board's predecessor in accordance with the provisions of the Dam Safety Act, Article 2, Chapter 6, Title 10.1 (§10.1-604 et seq.), of the Code of Virginia with an effective date of February 1, 1989 (4 VAC 50-20-10. Authority).

In 2001 (with an effective date of July 1, 2002), Chapter 92 [SB1166] of the Virginia Acts of Assembly dramatically increased the number of dams that fall under state regulation by broadening the definition of an impounding structure. As amended, the definition includes the following:

*§ 10.1-604 "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.*

\* The bracketed language was removed during the 2006 legislative Session [Chapter 30 (HB597) of the 2006 Virginia Acts of Assembly].

Authorities within the regulations were expanded by the Board in July 1, 2002 (Virginia Register Volume 18, Issue 14) in reaction to this legislative action.

The Virginia Soil and Water Conservation Board authorized DCR in July of 2005 to submit a NOIRA to consider changes and solicit recommendations related to the Board's Virginia Impounding Structure Regulations. The Board subsequently authorized and directed the filing of the proposed regulation at its November 15, 2006 meeting. At its February 1, 2008, the Board approved, authorized and directed the filing of the final regulations.

## Purpose

*Please explain the need for the new or amended regulation. Describe the rationale or justification of the proposed regulatory action. Detail the specific reasons it is essential to protect the health, safety or welfare of citizens. Discuss the goals of the proposal and the problems the proposal is intended to solve.*

As there have been no regulatory changes made to the impounding structure regulations since the late 1980's except to update the definition of regulated dams to conform it with the 2001 legislative change in definition [Chapter 92 (SB1166) of the 2001 Virginia Acts of Assembly], it was determined that this body of regulations required a substantive review and potential revisions. Since the 1980's, public safety concerns have evolved and engineering, technology and methodologies have advanced. These events have resulted in the need to consider amendments to the regulations. Further, with the significant revisions made to the Virginia Dam Safety Act during the 2006 legislative session [Chapter 30 (HB597) of the 2006 Virginia Acts of Assembly], it is necessary to update the regulations to reflect those revised and enhanced powers and authorities. It has also been determined that the administration and implementation of the Dam Safety Program could be improved through regulatory updates and that the intent and procedures embodied within the regulations could be clarified for the regulated community's and the public's benefit.

For the purposes outlined above and, most importantly, for the purpose of protecting the safety and welfare of the public and their property from the impacts of a dam failure, this regulatory action amends the Virginia Soil and Water Conservation Board's Impounding Structure Regulations to:

- 1) Revise the dam hazard potential classification system;
- 2) Specify that spillway design requirements are applicable to all state regulated dams;
- 3) Modify the spillway design requirements to enhance public safety and reduce subjectivity;
- 4) Allow for the potential reduction of the spillway design flood requirement through an incremental damage assessment for all qualified dams;

- 5) Establish dam break inundation zone mapping requirements;
- 6) Expand emergency action plan requirements for High and Significant Hazard Potential dams and emergency preparedness plan requirements for Low Hazard Potential dams;
- 7) Establish permit application fees for the administration of the Dam Safety Program that will create a stream of revenue sufficient to support an additional dam safety engineer;
- 8) Remove the forms that are incorporated by reference and move reporting standards into the regulations;
- 9) Create new definitions or modify current definitions;
- 10) Reorganize, clarify, and expand sections related to permitting procedures; and
- 11) Update sections related to inspections, enforcement, and unsafe conditions.

Making these key modifications to the regulations will result in a Dam Safety Program that will be better able to protect the public’s safety, treat all dam owners similarly and fairly in accordance with the regulations, increase awareness of dams and their potential impacts within local governments and their citizens, and help improve the administration of the program to the benefit of the public. The implementation of the criteria established in this regulation should minimize dam failure and the potential significant impacts associated with such a failure.

It should also be noted that many of these impounding structures also have environmental benefits in that they serve as sediment retention basins thus improving water quality. However, alternatively, the failure of such an impounding structure may result in significant downstream environmental damages should the sediment be released.

**Substance**

*Please identify and explain the new substantive provisions, the substantive changes to existing sections, or both where appropriate. A more detailed discussion is required under the “All changes made in this regulatory action” section.*

Key provisions of this regulatory action include the following:

- 1) A revision of the dam classification system from four categories (Class I, II, III, and IV) to three hazard classifications (High, Significant, and Low). **[4VAC50-20-40]**
  - This will conform the classification categories to those used by federal agencies and many states. Class III and Class IV dams are grouped together into the Low category.
  - In the final regulation, definitions were added for “Probable loss of life”, “May cause loss of life”, “No expected loss of life”, “Major roadways”, and “secondary roadways” in an effort to provide greater clarity to the distinctions between hazard potential classifications.
  
- 2) In the final regulation, a new section entitled “Special criteria for certain low hazard impounding structures” was added that specifies that should the failure of a Low hazard potential impounding structure cause no expected loss of human life and no economic damage to any property except property owned by the impounding structure owner, then the owner may follow the following requirements **[4VAC50-20-51]**:

- No dam break inundation zone map required pursuant to section 4VAC50-20-54; (a map would be advisable should development occur downstream);
- The spillway design flood for the impounding structure is recommended as a minimum 50-year flood; however, no specific spillway design flood shall be mandatory;
- No emergency preparedness plan prepared pursuant to 4VAC50-20-177 shall be required;
- An owner still shall perform inspections of the impounding structure; and
- No certificate or permit fee established in this chapter shall be applicable to the impounding structure.
- Of the 30 formerly Class IV dams in the Low classification, approximately 9 dams requiring a potential upgrade under the proposed regulations will not now require an upgrade due to this provision, thus resulting in a reduction in the fiscal impact of about \$25 million.

3) A specification that the Spillway Design Flood requirements (Table 1) are applicable to all dams not just “new” (post July 1982) dams. In addition, Table 1 is revised to:

- Reflect the revised dam classifications.
- Update spillway design requirements to enhance public safety and to move towards federal standards.
- Eliminate spillway design flood ranges which may result in inconsistency in application.
- Require that the spillway of all High hazard dams be engineered to pass the full Probable Maximum Flood.
- Specify minimum thresholds for incremental damage assessment [4VAC50-20-50]. It was determined that for the purposes of public safety that all dams should be regulated in accordance with standardized spillway design requirements and evaluation procedures.
- In the final regulation, within the Significant and Low hazard potential classes, the size categories were removed and a single spillway design flood standard established for each class. This change was instituted as it was agreed that hazard potential classification should be based on threat to life and property and should not be based on the size of the dam.
  - Within the Significant hazard class, the SDF was set at .5 PMF and the incremental threshold at 100-year.
  - Within the Low hazard class, the SDF was set at 100-year and the incremental threshold at 50-year.
    - The Spillway Design Flood standard in many states across the nation is .5 PMF for Significant and 100-year for Low.
    - Within the Significant class, in Virginia, only a handful of the 167 dams in the category are actually engineered to an SDF that exceeds .5 PMF at this time. Those primarily include dams that are owned by corporate utilities, localities, and the state. [29 dams > .5 PMF; only 10 were required to do so]
    - .5 PMF does represent a significant storm event. Tropical storm Gaston was approximately a .5 PMF storm.
    - Of the 167 dams in the Significant classification, approximately 50 dams requiring a potential upgrade under the proposed regulations will not now

require an upgrade, thus resulting in a reduction in the fiscal impact of about \$116 million.

**Revised and simplified Table 1**

Hazard Potential Class of Dam	Spillway Design Flood (SDF) <sup>B</sup>	Minimum Threshold for Incremental Damage Analysis
High	PMF <sup>C</sup>	.50 PMF
Significant	.50 PMF	100-YR <sup>D</sup>
Low	100-YR <sup>D</sup>	50-YR <sup>E</sup>

- In the final regulation, a note was added to encourage dam owners to build to a higher standard. “Due to potential for future development in the dam break inundation zone which would necessitate higher spillway design flood standards or other considerations, owners may find it advisable to consider a higher spillway design flood standard than is required.”
- In the final regulation, it was specified that a modified PMF may be calculated utilizing local topography, meteorological conditions, hydrological conditions, or PMP values supplied by NOAA.

4) The creation of a new section that allows for the potential reduction of the spillway design flood requirement through an incremental damage assessment for those dams meeting the specified administrative requirements. This would now be applicable to all eligible dams where previously it was only available to dams constructed prior to July 1982. Additionally, it is specified that the spillway design flood shall not be reduced below the minimum threshold values as determined by Table 1. [4VAC50-20-52]

- In consultation with the technical advisory committee, it was determined that the incremental damage assessment should be made available to all dam owners to see if a reduction in the required Spillway Design flood (SDF) could be considered where the breach of a dam would not significantly worsen downstream flooding. It was determined that a minimum threshold be established below which the SDF could not be reduced to set out a baseline that adequately protects public safety.
- In the final regulation, the prerequisites of the old subsection B of section 130 for determining who was eligible for conducting the engineering assessment were removed thus making the incremental damage assessment truly available to every dam owner to determine if the SDF requirement for their dam may be modified below the stated spillway design flood standard. This had been our intention all along.
- In the final regulation, the term “unacceptable” before “additional downstream threat” was removed and language was added that describes what is and would not be considered an “additional downstream threat”.
- In the proposed regulations unacceptable downstream threat was established at “water depths greater than two feet and overbank flow velocities greater than three feet per

second”. This was refined in the final regulation to read “when water depths exceed two feet or when the product of water depth (in feet) and flow velocity (in feet per second) is greater than seven”. The rule of seven as it might be characterized is utilized by a number of states to denote unacceptable impacts.

5) The creation of a new section that sets out dam break inundation zone mapping requirements. **[4VAC50-20-54]**

- In consultation with the TAC, it was determined that both for hazard potential classification determination for all dams and for Emergency Action Plans for High and Significant dams that a dam break inundation zone map should be required. In the final regulation, the map will specify the areas that might be inundated during both a sunny day failure, a spillway design flood with and without a dam failure, and a probable maximum flood (PMF) failure in order to demonstrate the levels where failure of the dam does not further constitute a hazard to downstream life or property. The areas to be impacted during a break should be the areas of focus for emergency warnings and evacuations. The SDF break mapping is targeted at emergency response and the PMF mapping at hazard potential classification.
- In the final regulation, “Public utilities that may be affected” was added to the list of elements required to be shown on the map. This information is necessary to make informed hazard potential classifications.
- NOTE: Additional authorities relative to dam break inundation zones that complement these regulations were provided to localities and the state during the 2008 legislative session [Chapter 491 (HB837) of the 2008 Virginia Acts of Assembly].

6) In the final regulation, a new section entitled “Reporting” was added **[4VAC50-20-59]**. This section notes that for the purposes of categorizing and reporting information to national and other dam safety databases, the size categorizations in Table 2 should be utilized. This includes both maximum impounding capacity and dam height specifications.

7) A specification that for each Operation and Maintenance certificate (Regular or Conditional) issued, the impounding structure owner shall send a copy of the certificate to the appropriate local government(s) with planning and zoning responsibilities. **[4VAC50-20-58]**

- As downstream development approved by a locality may result in the change in hazard potential classification of an upstream dam and the need for the dam to upgrade its spillway design at a significant expense to the owner, this notification may result in localities making more informed zoning decisions regarding a development.
- In the final regulation, the term “impounding structure breach” was changed to “impounding structure failure” in order to achieve consistent use of terms within the regulations.

8) The development of language establishing a delayed effective date for certain dams determined to have an adequate spillway capacity prior to the effective date of these regulations but that would require modifications due to changes in the regulations.

- It is specified that the owner shall submit to the Board an Alteration Permit Application and associated documents to address spillway capacity prior to the expiration of this Regular Operation and Maintenance Certificate or within 3 years of the effective date of



these regulations, whichever is later. As regular certificates are good for 6 years from time of issuance, this would mean that complete applications would be due no sooner than 3 years and no later than 6 years.

- It is specified that the Alteration Permit Application shall contain a construction sequence with milestones for completing the necessary improvements within 5 years of Alteration Permit issuance. (NOTE: 8 to 11 years in total to come into compliance) **[4VAC50-20-125]**
  - In light of the costs associated with upgrading a dam to meet the new spillway design safety requirements and the time necessary to conduct the associated engineering studies and alteration activities, it was determined that a phased in effective date should be included in the regulations for dams that currently meet regulatory standards.

9) The creation of a new section expanding emergency action plan requirements for High and Significant Hazard Potential dams. **[4VAC50-20-175]**

- A fundamental element of protecting against the loss of life that may occur upon the failure of an impounding structure is the development of an emergency action plan that may be successfully implemented. The plan would be developed and periodically tested in coordination with all entities, jurisdictions, and agencies that would be affected by a dam failure or that have statutory responsibilities for warning, evacuation, and post-flood actions.
- In the final regulation, the language:
  - Altered the frequency for table top exercises from once every 3 years to once every permit cycle (6 years).
  - Specified that annual drills and table top exercises for multiple impounding structures may be performed in combination if the involved parties are the same.
  - Eliminated the requirement that a critique of the drill and table top exercise be provided to the Department.
  - Clarified that the testing of monitoring, sensing, and warning equipment may be completed on a schedule set by Virginia Department of Emergency Management.
  - Clarified that the notification chart is not a list of every individual that needs to be contacted, but it is a list of those responsible parties that need to be contacted such as emergency management, sheriffs, police, etc.
  - Also clarified that the notification chart shall indicate how downstream property owners will be contacted (such as by reverse 911) and by whom.
  - Specified that the EAP does not have to be signed by all of the responsible parties but shall identify them and include a certification “that the EAP has been received by these parties”.

10) The creation of a new section establishing emergency preparedness plan requirements for each Low Hazard Potential dam. **[4VAC50-20-177]**

- As low hazard dams do not pose the same risk to loss of life as higher hazard dams, it was determined that an abbreviated emergency preparedness plan should be required. Such a plan would allow for contacts to downstream landowners that may sustain a loss of personal property should a dam fail (ex. farmer losing livestock or machinery).

11) The creation of a series of new sections that cites the authority for the Board to establish and collect application fees for the administration of the dam safety program, administrative review, certifications, and the repair and maintenance of dams and that establishes such fees.

- **4VAC 50-20-340** Authority to establish fees
- **4VAC 50-20-350** Fee Submittal Procedures
- **4VAC 50-20-360** Fee Exemptions
- **4VAC 50-20-370** Construction Permit Application Fees
- **4VAC 50-20-380** Regular Operation and Maintenance Certificate Application Fees
- **4VAC 50-20-390** Conditional Operation and Maintenance Certificate Application Fee
- **4VAC 50-20-400** Incremental Damage Analysis Review Fee
  - It is understood that the Commonwealth needs sufficient staff and fiscal resources to properly administer a regulatory program. A publication by the Association of State Dam Safety Officials (Model State Dam Safety Program, Association of State Dam Safety Officials, 1998) states 10 state regulators are needed for every 250 dams. The Department currently regulates almost 600 dams and has in its inventory over 1,700 dams, a significant number of which should be regulated, with only four Regional Engineer positions and one Program Manager. The staff workload is much higher than in other states.
  - The fees, which have been purposely set low to reduce constituent impacts, were further reduced from proposed regulations to final regulations. Construction remained the same but Regular O&M, Conditional O&M, and Incremental Damage Assessment fees were reduced or eliminated. This resulted in an overall annual reduction in revenue from fees of approximately 60%.

12) The removal of all forms currently incorporated by reference and incorporation of required elements of the forms into the regulations. Recommended forms will still be available.

- This will allow for the modification and improvement of forms without going through a lengthy regulatory action. The Department will still utilize a public process to make substantial changes to the forms.

13) The provision of definitions or modifications to definitions for “Agricultural purpose”, “Alteration”, “Construction”, “Dam break inundation zone”, “Department”, “Drill”, “Emergency Action Plan or EAP”, “Emergency Action Plan Exercise”, “Emergency Preparedness Plan”, “Freeboard”, “Height”, “Spillway”, “Stage I condition”, “Stage II condition”, Stage III condition”, “Sunny Day Dam Failure”, and “Tabletop Exercise”. **[4VAC50-20-30]**

- In order to support the above referenced amendments, the addition or alteration of definitions was necessary.
- In the final regulation:
  - The term “Alteration” was amended to clarify that “structural maintenance does not include routine maintenance”.
  - The term “Impounding structure” was modified to include the word “dam” as a synonym.
  - The term “Normal impounding capacity” was stricken and replaced with a definition for the term “Normal or typical water surface elevation” in order to

more accurately reflect terminology used in the field and to provide clarity for special situations, including flood control and stormwater management dams.

- A definition for the term “Planned land-use” was added to mean “land-use that has been approved by a locality or included in a master land-use plan by a locality, such as in a locality’s comprehensive land-use plan”. The regulations specify that planned land-use for which a development plan has been officially approved by the locality in the dam break inundation zones downstream from the impounding structure shall be considered in determining the hazard classification.
- Where ever “breach” was used, it was changed to “failure” in order to achieve consistent use of terminology in the regulations.

14) Reorganizes, clarifies, and expands multiple sections related to permits and repeals sections that are incorporated into the reorganized sections.

- In an effort to provide additional clarity to the permitting process, a number of the following sections related to permitting were reorganized. It is hoped that these revised sections will provide better guidance to the regulated community as they pursue the necessary permits and seek additional information regarding the permitting processes.
- **4VAC50-20-60** Required permits.
  - In the final regulation, clarified that a construction permit is required for “new” impounding structures.
- **4VAC50-20-70** Construction permits.
  - In the final regulation, clarified that a profile called for in the section was a “water surface” profile and updated reporting requirement terminologies for upstream and downstream slope and freeboard.
- **4VAC50-20-80** Alterations permits.
  - In the final regulation:
    - Clarified that Alteration permits are not needed for routine maintenance.
    - Clarified that a profile called for in the section was a “water surface” profile.
    - Updated reporting requirement terminologies for upstream and downstream slope and freeboard.
    - Fixed an incomplete sentence regarding the signing and submittal of the Record Report to DCR.
- **4VAC50-20-90** Transfer of permits.
- **4VAC50-20-105** Regular Operation and Maintenance Certificates.
  - In the final regulation, changed the term “floodplain” to “dam break inundation zone”.
- **4VAC50-20-150** Conditional Operation and Maintenance Certificate.
  - In the final regulation, specified that the owner’s deficiency correction plan is “approved” by the Board not “determined”.
- **4VAC50-20-155** Extension of Operation and Maintenance Certificates.
  - In the final regulation, added clarifying language that the owner must be making progress towards meeting the requirements “of the certificate in order to receive an extension”.
- **4VAC50-20-160** Additional operation and maintenance requirements.
- **4VAC50-20-170** Transfer of certificates.

15) The creation of a new section stating that dams operated primarily for agricultural purposes which are less than 25 feet in height or which create a maximum impoundment capacity smaller than 100 acre-feet are exempt from the regulations. **[4VAC50-20-165]**

- This is to clarify the exemption contained in 4VAC50-20-30 and 4VAC50-20-50 and to set out exemption validation procedures and reporting form components.
- In the final regulation, struck the work “possible” in front of “site visit” to read [..may be verified by the department through a site visit].

16) Updates sections related to inspections **[4VAC50-20-180]**, enforcement **[4VAC50-20-200]**, and unsafe conditions **[4VAC50-20-220]** to reflect changes in the Code pursuant to Chapter 30 (HB597) of the 2006 Virginia Acts of Assembly.

- These changes will conform the regulations to 2006 changes in the Virginia Dam Safety Act.
- In the final regulation, in section 180, struck the requirement that monitoring shall be “full-time”.

17) Updates the section **[4VAC50-20-20]** to specify that the design, inspection and maintenance of impounding structures shall be conducted utilizing competent, experienced, engineering judgment that takes into consideration factors including but not limited to local topography and meteorological conditions. This change is clarifying in nature and reflects current program administration.

- In the final regulation, clarified that the forms “noted” in the regulation are available on the DCR website.

18) In the final regulation, added an additional existing section **[4VAC50-20-190]** to the final regulation and modified it to additionally allow for an informal hearing should an owner be aggrieved by an action of the director or board. Also specified that a formal hearing may only be granted with the consent of the Board.

19) General improvements to sections for clarity.

- **4VAC50-20-210** Consulting committees.
- **4VAC50-20-230** Complaints.
- **4VAC50-20-240** Design of structures.
- **4VAC50-20-260** Spillway design.
  - In the final regulation, added an explanatory note on overtopping to explain that overtopping is an example of an occurrence that jeopardizes the safety of the impounding structure.
- **4VAC50-20-270** Principal spillways and outlet works.
- **4VAC50-20-280** Drain requirements.
  - In the final regulation, clarified that existing drains shall be kept operational and that when practicable existing impounding structures shall be retrofitted to permit draining.
- **4VAC50-20-290** Life of impounding structures.

- In the final regulation, clarified that impounding structure components shall be maintained.
- **4VAC50-20-300** Additional design requirements.
- **4VAC50-20-310** Plans and specifications.
- **4VAC50-20-320** Acceptable design procedures and references.
  - In the final regulation, fixed a typo; “Agency” to “Energy”
- **4VAC50-20-330** Other applicable dam safety references.
  - In the final regulation, specified that other dam safety references may include manuals, guidance, and forms provided by the Department.

## Issues

*Please identify the issues associated with the proposed regulatory action, including:*

- 1) the primary advantages and disadvantages to the public, such as individual private citizens or businesses, of implementing the new or amended provisions;*
  - 2) the primary advantages and disadvantages to the agency or the Commonwealth; and*
  - 3) other pertinent matters of interest to the regulated community, government officials, and the public.*
- If there are no disadvantages to the public or the Commonwealth, please indicate.*

The primary advantage of the final regulations is the enhancement of public safety. The final regulations help promote the safe design, construction, alteration, maintenance, and operation of impounding structures in the Commonwealth of Virginia, and thus benefit private citizens, businesses, local governments, and the Commonwealth as a whole. The proposed regulations also track federal standards closer in an effort to improve public safety. The Ad Hoc Dam Safety Study Committee, which was formed at the request of the Virginia Soil and Water Conservation Board, observed in its April 30, 2005 report that “[m]any of the nation’s dams, some originally built in the 1950s and 1960s, are in need of significant maintenance and/or redesign and upgrading. As a result of their age and unusually heavy rain events, a number of dams have failed and resulted in significant downstream damage, death or injury.” Maintaining the currently existing regulations will significantly hamper the efforts of the Board to strengthen the Dam Safety Program and to promote the safety of impounding structures in the Commonwealth.

In addition, the final regulations provide some environmental benefit. Impounding structures often are constructed as retention devices for silt and other materials; ensuring their safe operation and maintenance prevents these pollutants from being released into downstream water bodies and environments.

Potential failure of dams or living downstream of dams that are in need of upgrades may impact property and insurance values. Implementation of these regulations will reduce factors that can cause dam failures.

Finally, the current action is intended to increase user-friendliness of many aspects of the Dam Safety Program. Vague and confusing references within the regulations have been clarified or removed where possible, and outdated required forms have been removed from the regulations to

permit more frequent updates in order to enhance clarity and usefulness. In addition, confusing and conflicting provisions have been amended to allow for clarity and ease of understanding.

The primary disadvantages of the final regulations to private citizens, local governments, and agencies of the Commonwealth are upgrading and repair costs for those impounding structures in need of rehabilitation or upgrading based on the criteria set forth by the proposed regulations. The estimated costs of implementing dam upgrades to conform with SDF requirements in the proposed regulations was approximately \$249 million. Revisions made within the final regulations reduce this spillway upgrade cost by approximately \$142 million or put another way, represent a 57% reduction in spillway upgrade costs from the proposed regulations to the final regulations.

[Cost of Regulation: \$248,954,375 - \$116,730,000 (due to Spillway Design Flood requirement changes in Table 1) = **\$132,224,375** - \$25,275,000 (due to creation of a new section entitled “Special criteria for certain low hazard impounding structures”) = **\$106,949,375** (57% reduction in costs)]

While still substantial, these costs are markedly reduced from the proposed regulations, and are necessary to ensure that impounding structures are constructed, operated, and maintained in a way that adequately protects the safety of downstream homes, businesses, communities, and associated infrastructure. Other items that may be considered disadvantages by the dam owners are the costs associated with dam break inundation zone mapping, application fees, and EAP preparation. In the final regulations the application fees were reduced from those set out in the proposed regulations. Construction remained the same but Regular O&M, Conditional O&M, and Incremental Damage Assessment fees were reduced or eliminated. This resulted in an overall annual reduction in revenue from fees of approximately 60%.

[\$127,925 to **\$51,700** annual fee revenue estimate.]

**Changes made since the proposed stage**

*Please describe all changes made to the text of the proposed regulation since the publication of the proposed stage. For the Registrar’s office, please put an asterisk next to any substantive changes.*

<b>Section number</b>	<b>Requirement at proposed stage</b>	<b>What has changed</b>	<b>Rationale for change</b>
4VAC50-20-20	In subsection F, it references the forms “called for” in this chapter.	The terminology was changed from “called for” to “noted”.	As the incorporation of the forms has been repealed from this regulation, the change in terminology was warranted.
4VAC50-20-30	The term dam and impounding structure are utilized throughout this section and the regulation to refer to the regulated structures.	Where it was reasonable to do so, the term “dam” was changed to “impounding structure”. In the definition of “impounding structure” we also added “or dam” for those areas where it was inadvisable to alter the existing language.	The public had been confused about the use of two terminologies and inquired whether they were different and whether clarification could be provided.

4VAC50-20-30	The definition of alteration from the Code was included in the regulation. Structural repairs or structural maintenance are considered an alteration per the definition.	A statement was added that specifies that “structural maintenance does not include routine maintenance”.	Although it is the intent of the definition of alteration already, the statement was added to clarify that structural maintenance does not include routine maintenance at the request of a commenter.
4VAC50-20-30	The term, “normal impounding capacity,” referred to the volume of water or other materials capable of being impounded at the lowest ungated outlet from the impoundment.	The term, “normal or typical water surface elevation” replaces the term “normal impounding capacity.” This new definition also adds clarifications regarding situations where the normal pool of the impoundment is different than the level at the lowest ungated outlet and regarding flood control/stormwater detention facilities.	The new term and definition was added due to requests during the public comment period for additional clarity in this section, especially concerning flood control structures.
4VAC50-20-30	There was no definition for the term “planned land use,” which is used in the regulations on multiple occasions.	A definition for the term, “planned land use” has been added. That definition specifies that the term means “land use that has been approved by a locality or included in a master land use plan by a locality, such as in a locality’s comprehensive land use plan.”	Due to the term “planned land use” being applied to matters including the hazard classification of dams, numerous public comments had requested clarification of the meaning of that term.
4VAC50-20-30	The terms “breach” and “failure” are used interchangeably in the definition of “Stage II Condition” and elsewhere throughout the regulation.	The term “failure” has been substituted for the term “breach” throughout the regulation.	The public had been confused as to whether there was a difference between a “dam breach” and a “dam failure.” The change reflects the intent that the two terms have the same meaning.
4VAC50-20-40	The terms “probable loss of life”, “may cause loss of life”, and “no expected loss of life” were not defined by the proposed regulations.	Definitions for the terms “probable loss of life”, “may cause loss of life”, and “no expected loss of life” have been added to section 40.	The three defined terms are utilized in determining the proper hazard classification of a dam. Numerous public comments requested that they be better defined to allow for more accurate classifications.
4VAC50-20-40	Dams whose failure would affect “primary” public utilities were to be considered high hazard. Dams whose failure would affect “secondary” public utilities could be considered either significant or low hazard dams.	The qualifiers of “primary” and “secondary” have been removed from the regulations. The effect of a dam failure upon any type of utility may now be considered in making any hazard potential determination.	Following receipt of public comments on this subject, it is believed that damages to utilities are more appropriately categorized by their degree, and not necessarily by the type of utility damaged.
4VAC50-20-40	In making hazard potential determinations, it was	The qualifier of “public” has been removed, requiring that	Dam failures frequently damage both public and

	<p>required that impacts to various types of “public” roadways be considered. The terms “major roadways” and “secondary roadways” were not defined.</p>	<p>impacts to both private and public roadways be considered in making a hazard potential classification. To help distinguish among types of roadways, definitions for the terms “major roadways” and “secondary roadways” have been added.</p>	<p>private roadways (e.g., subdivision roadways). Private roadways may, at times, be traveled as heavily as certain public roadways. Therefore, it is believed to be proper to consider impacts to both private and public roadways, and to distinguish among them based upon type and volume.</p>
4VAC50-20-40	<p>The specifications of the term “low hazard potential” stated that the failure of a dam with that classification may cause economic damage to building(s), industrial or commercial facilities, secondary public utilities, secondary public roadways, railroads, personal property and agricultural interests. This same set of specifications was utilized in the definition of the term “significant hazard potential”.</p>	<p>The specification has been removed from the definition of “low hazard potential”.</p>	<p>The inclusion of the specification in the definition of “low hazard potential” was an error. Removing the detailed language associated with “economic damage” establishes a distinction between the significant and low classifications. The definition of the term “low hazard potential” continues to note that no more than minimal economic damage is to be expected from the failure of a dam of that classification.</p>
4VAC50-20-40	<p>Both the hazard potential classification and the size category for the hazard classification were to be proposed by the owner.</p>	<p>Size categories were removed from the spillway design classification determinations in Table 1 thus the removal of the reference to size categories in this section was necessary.</p>	<p>A number of public comments challenged the proposed regulations on the basis that it was the degree of damage that could be caused by a dam, and not its size that should be considered in making a hazard potential determination. In response to these comments, it was determined that size categories should be removed.</p>
4VAC50-20-40	<p>It was required that present and planned land use be considered when classifying a dam.</p>	<p>It is clarified that present and planned land use “for which a development plan has been officially approved by the locality” is to be considered in making a hazard potential classification.</p>	<p>A number of public comments asked for clarification as to what stages of development (present, proposed, approved, projected, etc.) had to be considered in making a hazard potential classification. The change clarifies the intent of the regulations.</p>
4VAC50-20-50	<p>It had been specified that</p>	<p>The specification has been</p>	<p>Determining maximum</p>



	<p>“Maximum Impounding Capacity and Height shall be determined in accordance with the definitions provided in 4VAC50-20-30.”</p>	<p>removed. The section now notes that Table 1 is applicable to all impounding structures that are 25 feet or greater in height and that create a maximum impounding capacity of 15 acre-feet or greater, and to all impounding structures that are 6 feet or greater in height and that create a maximum impounding capacity of 50 acre-feet or greater and is not otherwise exempt from regulation by the Code of Virginia.</p>	<p>impounding capacity and height for the purposes of section 50 is no longer necessary, as distinctions based on size have been removed from Table 1 of that section. The new language reflects the requirements of the Code of Virginia to clarify which structures Table 1 applies to.</p>
*4VAC50-20-50	<p>Table 1 contained distinctions based on size for significant and low hazard potential dams. Significant hazard potential dams were required to have spillway design floods ranging from .50 PMF to PMF, and low hazard dams were required to have spillway design floods ranging from 100 year to .50 PMF. The reductions that could be achieved through incremental analysis ranged from 100 year to .50 PMF for significant hazard potential dams, and from 50 year to 100 year for low hazard potential dams.</p>	<p>Table 1 has been revised so that distinctions based on size are removed. All significant hazard potential dams are required to be built to the .50 PMF. All low hazard potential dams are required to be built to the 100 year flood. Incremental analysis may be utilized to reduce the requirement for significant hazard potential dams to the 100 year flood, and to the 50 year flood for low hazard potential dams.</p>	<p>A number of public comments challenged the proposed regulations on the basis that it was the degree of damage that could be caused by a dam, and not its size, that should be considered in making a hazard potential determination. Other comments expressed the concern that several of the spillway design flood requirements contained in the proposed Table 1 were higher than necessary, and would impose an undue financial burden upon dam owners. Table 1 has been revised to no longer distinguish among dams based upon their size, and to establish spillway design flood requirements that are believed to be the minimum necessary to provide adequate protection for public safety.</p>
4VAC50-20-50	<p>Subsection B had stated that “the appropriate size category is determined by the largest size associated with the maximum impounding capacity and height of the impounding structure.”</p>	<p>The language contained in subsection B of the proposed regulations has been deleted.</p>	<p>As Table 1 no longer distinguishes between dams based upon their size, the language found in the proposed subsection B is no longer necessary.</p>
4VAC50-20-50	<p>Proposed subsection C of this section and others throughout the regulations use the terms “incremental damage analysis” and</p>	<p>The term “incremental damage analysis” has been substituted for the term “incremental damage assessment” in section 50 and elsewhere throughout the</p>	<p>In order to increase clarity, it is believed to be appropriate to use a single term for the incremental damage analysis.</p>

	“incremental damage assessment” interchangeably.	regulations.	
4VAC50-20-50	The proposed regulations did not advise dam owners to consider building their dams to a spillway design flood greater than that required by the regulations.	Subsection B now states that “due to potential for future development in the dam break inundation zone which would necessitate higher spillway design flood standards or other considerations, owners may find it advisable to consider a higher spillway design flood standard than is required.”	Development downstream from a dam frequently causes a need for upgrades in order to meet spillway design flood standards. Often, it is much more cost-effective for dam owners to over-build their dams initially, rather than to upgrade them in the future. The additional language points out that dam owners may wish to consider building to a higher standard than is required in order to avoid a need for upgrading in the future.
4VAC50-20-50	The proposed regulations state that the PMF is derived from the current probable maximum precipitation (PMP) available from the National Weather Service, NOAA.	An added provision was included that in some cases, a modified PMF may be calculated utilizing local topography, meteorological conditions, hydrological conditions, or PMP values supplied by NOAA.	Public comment explained a belief that a site-specific PMF should be permitted to be calculated. It is believed that this may be appropriate when proper factors are considered.
*4VAC50-20-51	The proposed regulations had reduced the number of hazard potential classifications from four to three. In so doing, what had been considered Class IV dams were included in the Low Hazard Potential classification contained in the proposed regulations. Being included in this category would have made Class IV dam owners subject to many requirements of the regulations that they had not previously been subject to.	New section 51 creates a series of special provisions related to certain low hazard dams. These provisions exempt such dams from many requirements of the regulations so long as they are certified as meeting the requirements of the section by a professional engineer. It is anticipated that this section will be utilized by current Class IV dam owners, and result in Class IV dams being treated largely the same under the new regulations as they were under the old regulations.	Class IV dams, by definition, do not pose a threat to human life or the property of anyone except for the dam owner. The requirements for a dam to qualify for the exception contained in section 51 are largely the same as the current requirements for Class IV dams. As these dams pose only a minimal threat, it is believed to be appropriate to exempt such dams from several of the requirements of the regulations. This will save costs for current Class IV dam owners.
4VAC50-20-52	Subsection B of the proposed regulations had set forth a number of prerequisites to a dam owner being eligible to conduct an incremental damage analysis to potentially reduce spillway design flood requirements for a dam. These prerequisites were largely a	The prerequisites that were included in subsection B of the proposed regulations have been deleted.	The intent of the new regulations is to make the incremental damage analysis available to all dam owners. The prerequisites contained in the proposed regulations would not have accomplished this intent.

	carryover from section 130 of the old regulations.		
4VAC50-20-52	Proposed subsection C of section 52 did not clearly state that site-specific conditions should be recognized and considered in completing an incremental analysis.	A statement that, “site-specific conditions should be recognized and considered” has been added to subsection B of section 52 (formerly proposed subsection C).	The statement added to subsection B clarifies the intent of the subsection.
4VAC50-20-52	Proposed subsection C of section 52 had specified that water depths greater than two feet and overbank flow velocities greater than three feet per second shall be used to define conditions for unacceptable downstream threat to persons or property.	Subsection B of the final regulation replaces the statement from the proposed regulations with a statement that “An additional downstream threat to persons or property is presumed to exist when water depths exceed two feet or when the product of water depth (in feet) and flow velocity (in feet per second) is greater than seven.	The language in the proposed regulations was intended to be based on the “Rule of 7s”, a methodology used by other states for determining unacceptable downstream threats posed by dams. More accurate language was discovered since the time of the proposed regulations and the new language was inserted to ensure accuracy and clarity.
4VAC50-20-52	The proposed regulations did not include any statement clarifying that the Board may review spillway design flood requirements based on changed conditions at and downstream of a dam.	New subsection D of section 52 provides that “The required spillway design flood shall be subject to reclassification by the board as necessary to reflect changed conditions at the impounding structure and in the dam break inundation zone.”	The hazard classification and spillway design requirements are based upon what is located downstream of a dam, and the results of an incremental damage analysis are dependent on the characteristics of an impoundment and what is located downstream. As downstream conditions can change frequently, review of spillway design requirements is needed on an ongoing basis. The added language clarifies that the Board may undertake this review.
4VAC50-20-54	Subsection B of proposed section 54 had stated that mapping the inundation zone of a dam to a level where the water surface elevation of the dam break inundation zone and the water surface elevation during a nonfailure event converge to within one foot of each other was demonstrative of “a level where failure of the dam does not further constitute a hazard to downstream life or	The language indicating that the mapping level contained in the proposed regulation demonstrates a level where failure of the dam does not further constitute a hazard to downstream life or property has been removed.	The statement contained in the proposed regulations was in conflict with the Rule of 7s contained in section 52, which provides a rationale for determining downstream threat that is utilized by other states. Removing the language from section 54 eliminates this conflict and allows the more reliable Rule of 7s analysis to clearly govern.

	property.”		
4VAC50-20-54	Proposed subsection B had stated that “The inundation maps shall be supplemented with water surface profiles and cross sections at critical areas.”	The phrase “and cross sections at critical areas” has been removed.	Requiring cross-sections provides detail beyond what is necessary to make an accurate determination as to hazard and imposes significant cost on dam owners. Public comment requested that this requirement be removed.
4VAC50-20-54	Subdivision (D)(2) of the proposed regulations required mapping of a probable maximum flood with a dam failure.	Subdivision (D)(2) has been revised to replace “a probable maximum flood” with “the spillway design flood.”	The proper flood event to be mapped is the spillway design flood, and not the probable maximum flood (a requirement for probable maximum flood mapping was added to subdivision (D)(4)). The amendment corrects this.
4VAC50-20-54	Subdivision (D)(3) of the proposed regulations required mapping of a “dam break analysis utilizing the probable maximum flood without a dam failure.”	As with the immediately preceding comment, “probable maximum flood” has been replaced with the “spillway design flood.” In addition, the specification that the analysis should be a “dam break” analysis has been removed.	As with the immediately preceding comment, the spillway design flood is the proper flood event to be mapped. Additionally, terming this analysis a “dam break” analysis caused confusion that was pointed out in public comment, as the subdivision goes on to specify that this map should be drawn “without a dam failure.” The amendment is intended to remove this confusion.
4VAC50-20-54	The proposed regulations contained no mapping requirement related to potential future development in the dam break inundation zone.	Subdivision (D)(4) was added to the regulations to require that a probable maximum flood event with a dam failure be mapped for purposes of evaluating the impacts of future development on a dam.	Development within a dam break inundation zone affects the hazard classification and spillway design requirements of a dam. The only way to determine the effects that downstream development has on a dam is to evaluate its location within a dam break inundation zone through precise mapping. A map of a probable maximum flood with a dam failure represents the worst flood that could impact the area downstream of a dam; therefore, utilizing it in reviewing the impacts of development allows full review of the potential

			impacts of a dam under the most serious circumstances.
4VAC50-20-54	Subdivision (F)(1) omitted public utilities from its list of facilities required to be shown on a dam break inundation zone map for emergency action planning purposes.	“Public utilities that may be affected” have been added to the list of facilities required to be shown on a dam break inundation zone map in subdivision (F)(1).	Impacts to public utilities may affect both public safety and economic interests and they should be considered in developing an emergency action plan for a dam.
4VAC50-20-54	Subdivision (F)(2) had stated that each dam break inundation zone map should include a note that states “Mapping of flooded areas and flood wave travel times are approximate. Timing and extent of actual inundation may differ from information presented on this map.”	The statement from the proposed regulations has been replaced with language requiring that each dam break inundation zone map include a statement that “The information contained in this map is prepared for use in notification of downstream property owners by emergency management personnel.”	It was pointed out in public comment that the statement contained in the proposed regulations did little to aid those utilizing dam break inundation zone maps for emergency planning purposes, and may cause confusion. The statement that has been substituted clarifies the intended use of the maps.
4VAC50-20-59	This section was not included in the proposed regulations. Size categories of impounding structures were included in Table 1 of section 50.	The size categories contained in Table 1 of section 50 have been removed due to amendments of the requirements of that section. Section 59 has been created and includes Table 2, which specifies the size categories of dams.	While size categories may no longer be utilized in determining the spillway design requirements of a dam, they are important for categorization and reporting purposes, as well as comparison of dams across the Commonwealth and the United States. New section 59 merely recites these size categories so that they may be known and utilized by the regulated community.
4VAC50-20-60	Subsection A of the proposed regulations stated that no person or entity shall construct or begin to construct an impounding structure until the board has issued a construction permit.	Subsection A has been clarified to specify that no person or entity shall construct or begin to construct “a new” impounding structure until the board has issued a construction permit.	It was pointed out in public comment that construction activities occurring on an existing dam receive an alteration permit, not a construction permit. The amendment merely clarifies that construction permits are intended for new (and not existing) impounding structures.
4VAC50-20-70	Subsection B specified that a design report form “will be” available from the Department of Conservation and Recreation	Subsection B has been amended to specify that a design report form “is” available from the Department	A form for a design report is available from the Department.
4VAC50-20-70	Subdivisions B(6)(f) and (g) required that data related to the slope of a dam be expressed in terms of	Both subdivisions have been amended to require that data related to slope be expressed in terms of “horizontal to vertical.”	This amendment was made to conform to trade usage of the terms utilized. It does not alter the intent of the

	“horizontal and vertical.”		regulations.
4VAC50-20-70	Subdivision B(7)(g) defined “freeboard” as “normal pool to top of dam.”	The definition has been removed from this subdivision.	The term “freeboard” is defined in section 30 of the regulations. An incomplete definition of the term in this section may cause confusion.
4VAC50-20-70	Subdivision B(19) required that other pertinent design data be submitted with an application for a construction permit, including a plan and profile of the dam break inundation zone.	The profile required by subdivision B(19) has been further clarified as a “water surface” profile.	The amendment clarifies what was meant by the requirement contained in the proposed regulations.
4VAC50-20-70	Subdivisions J(2)(f) (6) and (7) required that data related to the slope of a dam be expressed in terms of “horizontal and vertical.”	Both subdivisions have been amended to require that data related to slope be expressed in terms of “horizontal to vertical.”	This amendment was made to conform to trade usage of the terms utilized. It does not alter the intent of the regulations.
4VAC50-20-70	Subdivision J(2)(g)(7) defined “freeboard” as “normal pool to top of dam.”	The definition has been removed from this subdivision.	The term “freeboard” is defined in section 30 of the regulations. An incomplete definition of the term in this section may cause confusion.
4VAC50-20-70	Subdivision J(2)(i) required that confirmation be given as to whether the impounding structure has ever been overtopped.	The confirmation as to overtopping has been removed.	Section 70 deals with construction permits for new dams. A dam that has not yet been constructed/completed cannot have overtopped. The requirement contained in the proposed regulations was an oversight and its presence could have caused unnecessary confusion.
4VAC50-20-80	Subsection A of the proposed regulations contained specifications as to what constitutes an alteration. Structural maintenance was included as an action that constituted an alteration requiring a permit.	A clarification has been added that the term “structural maintenance” does not include “routine maintenance.”	Public comments expressed concern that the term “structural maintenance” could be construed to include minor, normal maintenance to a dam. This was not the intent of the regulations and the amendment clarifies that routine maintenance does not require an alteration permit.
4VAC50-20-80	Subsection B specified that a design report form “will be” available from the Department of Conservation and Recreation	Subsection B has been amended to specify that a design report form “is” available from the Department	A form for a design report is available from the Department
4VAC50-20-80	Subdivisions B(6)(f) and (g) required that data related to	Both subdivisions have been amended to require that data	This amendment was made to conform to trade usage of

	the slope of a dam be expressed in terms of “horizontal and vertical.”	related to slope be expressed in terms of “horizontal to vertical.”	the terms utilized. It does not alter the intent of the regulations.
4VAC50-20-80	Subdivision B(7)(g) defined “freeboard” as “normal pool to top of dam.”	The definition has been removed from this subdivision.	The term “freeboard” is defined in section 30 of the regulations. An incomplete definition of the term in this section may cause confusion.
4VAC50-20-80	Subdivision B(16) required that other pertinent design data be submitted with an application for a construction permit, including a plan and profile of the dam break inundation zone.	The profile required by subdivision B(16) has been further clarified as a “water surface” profile.	The amendment clarifies what was meant by the requirement contained in the proposed regulations.
4VAC50-20-80	Subsection I specified that a record report form “will be” available from the Department of Conservation and Recreation	Subsection I has been amended to specify that a record report form “is” available from the Department	A form for a record report is available from the Department
4VAC50-20-80	Subsection I contained an incomplete sentence regarding what needs to be done with a record report.	The incomplete sentence in subsection I has been amended to specify that “The Record Report shall be signed and sealed by a licensed professional engineer and signed by the owner and shall be sent to the department indicating that the modifications made to structural features of the impounding structure have been completed.”	The amendment fixes typographical errors in the proposed regulations.
4VAC50-20-80	Subdivisions I(6)(f) and (g) required that data related to the slope of a dam be expressed in terms of “horizontal and vertical.”	Both subdivisions have been amended to require that data related to slope be expressed in terms of “horizontal to vertical.”	This amendment was made to conform to trade usage of the terms utilized. It does not alter the intent of the regulations.
4VAC50-20-80	Subdivision I(7)(g) defined “freeboard” as “normal pool to top of dam.”	The definition has been removed from this subdivision.	The term “freeboard” is defined in section 30 of the regulations. An incomplete definition of the term in this section may cause confusion.
4VAC50-20-80	Subdivisions I(15) and (16) of the proposed regulations required certifications by the dam owner’s engineer that information provided pursuant to subdivision I(2) was true and correct, and a certification by the dam owner that he or she had received the information required by subdivision I(2).	The subdivisions have been amended to specify that the certifications apply to all information provided pursuant to subsection I.	It is intended that the certifications apply to all information submitted pursuant to subsection I. Further, there was no subdivision I(2) in the proposed regulations. The amendment clarifies intent and removes an error in the proposed regulations.
4VAC50-20-90	Subsection A specified that a	Subsection B has been amended	A transfer notification form

	transfer notification form “will be” available from the Department of Conservation and Recreation	to specify that a transfer notification form “is” available from the Department	is available from the Department
4VAC50-20-105	Subsection C specified that a Operation and Maintenance Certificate Application form “will be” available from the Department of Conservation and Recreation	Subsection B has been amended to specify that a Regular Operation and Maintenance Certificate application form “is” available from the Department	A form is available from the Department.
4VAC50-20-105	Subdivision E(2)(e)(13) of the proposed regulations required that inspection observations include general information, including notes on new development in the downstream “floodplain” of the dam, that would impact hazard classification.	The term “floodplain” has been replaced with the term “dam break inundation zone.” Additionally, a requirement was added that development that would affect spillway design flood requirements be noted.	The intent of the use of the term “floodplain” was to imply the dam break inundation zone of the dam. The amendment clarifies intent and eliminates confusion that could be caused by the use of the term “floodplain.” Secondly, the addition of a requirement for consideration of development that could impact spillway design requirements allows the true intent of the subdivision to be achieved, as it is the design of a spillway that protects public safety.
4VAC50-20-150	The proposed regulations had specified that a Conditional Operation and Maintenance Certificate would require that the dam owner correct deficiencies on a schedule “determined” by the board.	The specification that the schedule would be “determined” by the board has been replaced with a specification that the schedule will be “approved” by the board.	Schedules for dam repairs come as a result of consultation between the Board/Department and the dam owner. Specifying that the schedule will be “determined” by the Board negates this cooperative process.
4VAC50-20-155	The proposed regulations contain a sentence that does not clearly and explicitly state that substantial and continual progress towards meeting the requirements of a certificate must be made in order to receive an extension.	Clarifying language has been added to the section to explain that substantial and continual progress towards meeting the requirements of a certificate must be made in order to receive an extension.	The amendment simply clarifies the intent of the section and makes explicit what the proposed regulations had implied.
4VAC50-20-165	Subsection C had specified that an Agricultural Exemption report “may” be verified by the department through a “possible” site visit.	The word “possible” has been removed from subsection C.	As the Report “may” be verified, it is unnecessary to note that a site visit is “possible,” as any verification action is entirely voluntary on the part of the Department.
4VAC50-20-170	Subsection A specified that a transfer notification form	Subsection A has been amended to specify that a transfer	A form is available from the Department.



	“will be” available from the Department of Conservation and Recreation	notification form “is” available from the Department	
4VAC50-20-175	Subsection D required the owner to update an Emergency Action Plan immediately upon becoming aware of necessary changes.	A requirement for the updated Emergency Action Plan to be resubmitted has been added.	Emergency Action Plans are intended to be used by a variety of agencies in the event of an emergency at the dam in order to protect life and property. Ensuring the submission of updates helps ensure that important information is available to all parties and allows the Department to verify changes needed to the EAP.
4VAC50-20-175	Subsection E required table top exercises to be conducted once every three years.	The requirement for table top exercises to be conducted once every three years has been changed to once every six years, although more frequent exercises are encouraged. Additionally, a clarification was added that drills and table top exercises for multiple dams may be combined where the involved parties are the same.	Public comment explained that conducting table top exercises once every three years could be overly burdensome on dam owners. Public comment additionally requested clarification as to whether owners of multiple dams could combine the drills and table top exercises for those dams where the situations would be similar.
4VAC50-20-175	Subsection E required dam owners to submit a critique of emergency action plan exercises to the Department.	The requirement for the submission of a critique has been removed.	Public comment requested that the requirement for the submission of a critique for emergency action plan exercises to be removed to allow dam owners to focus on carrying out the exercises, rather than reporting to the Department.
4VAC50-20-175	Subsection F required dam owners to test monitoring, sensing, and warning equipment at remote or unattended dams at least twice per year.	Language has been added providing that testing shall occur twice per year or as performed by the Virginia Department of Emergency Management pursuant to §10.1-609.1 of the Code of Virginia.	Certain monitoring equipment on dams owned by Soil and Water Conservation Districts is maintained and tested by VDEM pursuant to the Code of Virginia. The amendment allows the testing carried out by VDEM to be sufficient to meet testing requirements as to this equipment.
4VAC50-20-175	Subdivision G(1) required a notification chart to be developed that showed who should be notified in the event of an emergency and that contained contact information for those parties.	A descriptive list of persons to be contacted in the event of an emergency has been added to the subdivision. This list includes the dam owner or manager, state and local emergency management officials, local	Public comment expressed the concern that the general language used by the proposed regulations could imply that the dam owner was responsible for contacting all downstream

	The types of parties to be included was not specified.	police or sheriffs departments, and the dam owner’s engineer. In addition, it is required that the notification chart identify the process by which downstream property owners will be notified, and what party is responsible for that notification.	residents, which could be difficult in situations where many individuals reside downstream of a dam. The amendments clarify that the dam owner may rely on other agencies for such notifications, so long as several primary agencies are notified of an emergency situation and the owner’s Emergency Action Plan demonstrates that a process is in place to achieve notification of those downstream.
4VAC50-20-175	Subdivision G(7) required that all parties assigned responsibilities under an Emergency Action Plan to sign the Plan to acknowledge receipt of a copy.	The requirement for all other parties to sign the Emergency Action Plan has been replaced with a certification by the dam owner that all other parties have received a copy of the Plan.	Several local governments expressed an unwillingness to sign Emergency Action Plans during the public comment period, citing liability concerns. As was evident from the language of the proposed regulations, the true intent of the subdivision was to prove that parties had received a copy of the Emergency Action Plan. The amendment allows for this certification while alleviating the concerns raised in the public comment period.
4VAC50-20-177	Subsection A specified that an Emergency Preparedness Plan form “will be” available from the Department of Conservation and Recreation	Subsection A has been amended to specify that a form “is” available from the Department	A form is available from the Department.
4VAC50-20-180	Subsection B required that a licensed professional engineer provide full time monitoring of all construction or alteration activities.	The requirement that monitoring be full time has been removed.	Public comment expressed the feeling that full time monitoring of all activities by a license professional engineer is not necessary.
4VAC50-20-190	It was specified that any owner aggrieved by the action or inaction of the director of the department or the board could demand a formal hearing.	The section has been amended to specify that an aggrieved owner may demand an informal fact finding proceeding, and that a formal hearing may only be granted with the consent of the Board.	Informal fact finding proceedings are the preferred method for the review and resolution of matters by an administrative agency. They are less burdensome and less costly for all parties involved. Should a formal hearing truly be necessary, such a hearing can be held with the

			consent of the board. Owners wishing to do so may appeal the outcome of either an informal fact finding proceeding or a formal hearing to circuit court.
4VAC50-20-260	Subsection B specified that vegetated earth or an unlined emergency spillway may be approved when it can be demonstrated that it will pass the spillway design flood without jeopardizing the safety of the impounding structure.	Language has been added to indicate that the allowance of overtopping of a structure not designed to permit overtopping would be an example of an event that jeopardizes the safety of the impounding structure.	The amendment clarifies that overtopping is an event that jeopardizes the safety of a dam, except for those dams designed to permit overtopping (i.e., roller compacted concrete structures).
4VAC50-20-280	The proposed regulations required that all new dams include a device to permit draining of the dam within a reasonable period of time, as determined by the dam owner's engineer. The engineer's determination was subject to the approval of the director.	The need for the director's approval of the engineer's determination has been removed. Additionally, a requirement that existing drains be kept operational and that existing dams without drains be retrofitted where practicable has been added.	Public comments requested that all dams be required to include draining mechanisms. While this is not believed to be practicable for all existing dams, it is agreed that it should be accomplished where practicable. The director's approval of the engineer's determination as to the size of a drain is unnecessary, as the department approves all plans for new dams prior to their construction.
4VAC50-20-290	The proposed regulations required that components of a dam be replaced in keeping with the design and planned life of the dam.	A clarification was added that components of a dam should be maintained or replaced in keeping with the design and planned life of the dam.	Components of a dam may be in need of maintenance, not replacement. The amendment clarifies the intent of the section.
4VAC50-20-320	Subdivision 5 specified that the design procedures, manuals, and criteria used by the United States Federal Agency Regulatory Commission may be utilized.	The language of the subdivision has been corrected to specify that the agency cited is the United States Federal Energy Regulatory Commission.	The amendment corrects an error in the proposed regulations.
4VAC50-20-330	The proposed regulations permitted documents used by the Federal Emergency Management Agency to be utilized as reference sources.	Manuals, guidance, and forms provided by the Department of Conservation and Recreation have been added as acceptable references in subsection B.	Public comment pointed out that the regulations should clarify that Department-issued guidance may be used as a reference.
4VAC50-20-350	Subsection B specified that fees should be submitted to Dam Safety Receipts Control, P.O. Box 10150, Richmond, Virginia 23240.	The address for the submission of fees has been changed to Division of Finance, Accounts Payable, 203 Governor Street, 4 <sup>th</sup> Floor, Richmond, Virginia 23219.	The amendment corrects the address for the submission of fees.
4VAC50-20-	The proposed regulations	Low hazard impounding	The fee structure contained

360	specified that dams owned by Soil and Water Conservation Districts were exempt from the fees imposed by Part VI of the regulations.	structures explicitly exempt from fees pursuant to section 51 of the regulations have also been exempted from paying fees and language to that effect has been added to this section. It has also been clarified that the exemptions provided by the section apply to the fees imposed by “this part” (fees), rather than “Part VI”.	in the proposed regulations has been reviewed following receipt of public comment. It has been decided to exempt certain low hazard dams from fee requirements.
4VAC50-20-380	Fees for Regular Operation and Maintenance Certificates were \$1,500 for a High Hazard dam, \$1,000 for a Significant Hazard dam, and \$600 for a Low Hazard dam.	The fee for a High Hazard dam has been reduced to \$600, the fee for a Significant Hazard dam has been reduced to \$600, and the fee for a low hazard dam (other than those exempted from fees) has been reduced to \$300. Additionally, it is specified that the fee for the extension of a Regular Operation and Maintenance Certificate is \$250 per year or portion thereof.	The fee structure contained in the proposed regulations has been reviewed following the receipt of public comment and it was determined that fees should be reduced. Additionally, the proposed regulations did not specify a fee for an extension of a certificate.
4VAC50-20-390	Fees for a Conditional Operation and Maintenance Certificate or for the extension of a Conditional Operation and Maintenance Certificate were \$1,000 for a two year certificate, \$750 for a 1.5 year certificate, \$500 for a one year certificate, and \$250 for a six month certificate.	The fee for a certificate for more than one year but no more than two years has been reduced to \$300, the fee for a certificate for one year or less has been reduced to \$150, and the fee for an extension has been set at \$250 per year or portion thereof. Additionally, a provision that specified that credits toward a Regular Operation and Maintenance Certificate based on the unused portion of a Conditional Certificate could only be provided to the nearest six-month interval has been removed. Credits may now be provided for any unused portion.	The fee structure contained in the proposed regulations has been reviewed following the receipt of public comment and it was determined that fees should be reduced. In order to encourage conditional certificate holders to make required repairs and upgrades to their dams, the fee for an extension of a conditional certificate is set at a level slightly higher than that of the original certificate.
4VAC50-20-400	The fee for reviewing an incremental analysis was set at \$225, with a \$45 fee for any resubmittal.	The fee for review of an incremental analysis has been removed, although authority for the department to charge costs for any necessary outside expertise on a review has been retained.	It was determined that in normal cases, the work associated with reviewing an incremental analysis does not require an additional fee. Extraordinary cases may require the hiring of an outside consultant, thus the authority for the department to charge costs (with the agreement of the dam owner) has been retained for use in such cases.