VIRGINIA SOIL AND WATER CONSERVATION BOARD
Impounding Structure (Dam Safety) Recommended Final Regulations

This document represents the Agency response to comments received during the 60-day public comment period on the proposed regulations held from August 20, 2007 through October 19, 2007 and during the five associated public hearings on the following dates and locations:

October 4, 2007 in Roanoke, Virginia
October 9, 2007 in Hampton, Virginia
October 10, 2007 in Richmond, Virginia
October 11, 2007 in Verona, Virginia
October 16, 2007 in Manassas, Virginia

In summary, 44 written comments were received and 17 people spoke over the course of 5 public hearings.

	Commenter	Comment	Agency response
1	Sidney O. Dewberry (Dewberry & Davis, LLC)	The regulatory changes concerning permitting and reporting requirements, emergency action plan development and clarification of terminology are much needed enhancements to the regulations. In particular, the updated criteria for development of emergency action plans will go a long way towards increasing safety for persons and property located within potential dam break inundation zones.	The changes made concerning permitting and reporting requirements, emergency action plan development and clarification of terminology are intended to enhance the Dam Safety program to help ensure public safety and provide clarity and predictability for the regulated community.
2	Sidney O. Dewberry (Dewberry & Davis, LLC)	We understand and appreciate the notion that in the interest of public safety there should be no distinction between existing or new dams when it comes to design criteria. While it is difficult to argue against this position from a public safety standpoint, the implication is that funding should not be a factor when it comes to public safety. However, funding is usually a factor which must be considered alongside risk when making decisions concerning rehabilitation of the nation's infrastructure. Upgrading dams to meet current design standards can often be cost prohibitive and in some cases unwarranted if a significant improvement in public safety is not achieved.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made in the final regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design flood of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat.

			The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
3	Sidney O. Dewberry (Dewberry & Davis, LLC)	It is our opinion that engineering judgment and risk assessment should remain a key element in making determinations concerning the need for dam upgrades and in prioritizing/scheduling dam rehabilitation projects and this principle should not be lost with the adoption of new dam safety regulations.	The regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "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." It is expected that engineering judgment will still be applicable to areas including, but not necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
4	Sidney O. Dewberry (Dewberry & Davis, LLC)	We therefore encourage the Department of Conservation and Recreation to continue distinguishing between existing and new dams in the regulations and to recognize the need for case by case evaluations of existing dams with respect to meeting current design criteria.	The concept of maintaining a distinction between new and existing dams was discussed extensively with the technical advisory committee (TAC) that assisted with the development of these regulations. The consensus of the TAC was that public safety requires equal treatment of all dams, as safety is influenced by the condition of a dam, and not its age. Secondly, each dam is intended to be evaluated individually for conformance to the regulations. It is recognized that specific characteristics of each dam and varying site conditions will make an individual assessment necessary. In the interest of public safety, however, minimum standards for the design and maintenance of dams are necessary. The regulations are designed to adequately address public safety in all areas of the state while recognizing the need for site-specific determinations.
5	Sidney O. Dewberry	We support further consideration of Alternative 2 as described in the Ad Hoc	Alternative 2, which was an alternative matrix for the required spillway design

	(Dewberry & Davis, LLC); Linda and Gerord Korinsky; Raymond and Brenda Crawford; John Martin; Debra Koren; Steven Moore; David Goins; Bruce Synder; James and Julie McComb; William B. Lipscomb; Mary Lipscomb; Nathan Pope; Norman W. Richards; Franklin Chamberlain	Dam Safety Study Committee report dated 4-30-05, which outlines an alternative procedure for regulation of existing dams.	flood for dams, was discussed extensively by the technical advisory committee (TAC) that assisted with the development of the regulations. A subcommittee of the TAC met to discuss this concept specifically. After that subcommittee meeting, and a discussion of the full TAC, it was agreed that allowing considerations not related to the design and operation of the dam to influence the required spillway design standard would not be protective of public safety. Rather than Alternative 2, the regulations permit the spillway design requirement for a dam to be reduced in cases where it can be shown that failure of the dam would not pose an additional downstream threat. This incremental analysis is contained in section 52. It is believed that this provision will allow reductions in spillway design requirements where engineering data can show that the reductions do not come at the cost of public safety.
6	Mark Fendig (Luminaire Technologies, Inc.)	I can tell you from experience that the small dam owner will have a hard time getting even a quote from any of the engineering firms. I feel Dam Safety is out of touch with the high costs of engineering firms now.	It is recognized that engineering work associated with the requirements of the regulations will have costs. The only way to ensure that dams are constructed, operated, and maintained in a way that adequately protects public safety, however, is by conducting engineering analysis that demonstrates actual conditions.
7	Mark Fendig (Luminaire Technologies, Inc.)	I suggest that the existing Class 4 dams that have already been issued an Operation and Maintenance Certificate should not have to pay any fees to maintain (renew) the Certificate unless they were constructed on or after 2001 when Dam Safety lowered the dam height requirements that removed their exempt status.	New section 51 has been added to the regulations in order to address certain low hazard dams; many of these dams are currently Class IV dams. The new section specifies that no certification or permit fee is applicable to a low hazard dam covered by the section.
8	Mark Fendig (Luminaire Technologies, Inc.)	I suggest that DCR Dam Safety should exempt any dam from an Operating Certificate and any fees if the dam is built and being used in conjunction with any in stream mining operation that is regulated by DMME.	Certain dams subject to regulation by the Department of Mines, Minerals, and Energy are specifically exempt from the regulations pursuant to section 10.1-604 of the Code of Virginia. The regulations recognize this in section 50. Being exempt from the regulations, these dams would likewise not be subject to the fees established. For dams that are subject to the regulations,

			fees have been established pursuant to the authority granted to the board by section 10.1-613.5 of the Code of Virginia. These fees are intended to cover the cost of a small portion of the administration of the Dam Safety program and have been amended and reduced from the amounts contained in the proposed regulations. All of these dams influence that program's workload, and there is no reason for exempting certain classes beyond those specifically exempted by the Code.
9	Mark Fendig (Luminaire Technologies, Inc.)	I also suggest DCR Dam Safety offer existing dam owners who have paid the required fees for an Operation and Maintenance Certificate not be required to pay any additional fees for having an alteration permit issued for the purpose of on-going dam maintenance and renewal work that may be required to keep the Operation and Maintenance Certificate in place.	The regulations do not contain a fee for alteration permits.
10	Ray Scher	The new Dam Safety Regulations should be the least restrictive (minimum) regulations approved by the Board. If anything, I believe the Board may find the need to strengthen (not water down) the proposed regulations to insure the public safety of the citizens of the Commonwealth.	It is recognized and agreed that the regulations need to adequately protect the safety of the Commonwealth's citizens. The proposed regulations seek to maintain a proper level of public safety while imposing the minimum burden necessary on dam owners.
11	Wayne Poyer (Lake Holiday)	100% PMP for SDF represents an extreme solution defined by the most improbable circumstances. To enforce that standard of compliance while cognizant of the unanswered financial questions is, in our view, not practical.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942). Financial needs of dam owners are recognized. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners

			as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
12	Wayne Poyer (Lake Holiday)	The likelihood of ever experiencing a PMP storm centered over the watersheds of existing dams like Lake Holiday is so remote that a reduced level of precipitation should be considered based upon an analysis of storm events that have occurred in the state of Virginia. The risks associated with a "sunny day" dam failure are not zero, and therefore, the risks of overtopping existing dams should be reasonable, not zero.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942). As to non-flood events, the regulations require that impounding structures be constructed according to one of several sets of criteria contained in section 320. The regulations also contain requirements related to design and maintenance of impounding structures and require inspections by a professional engineer at intervals between two and six years depending on the hazard classification of the impounding structure. These requirements aim to provide protection from sunny day dam failures.
13	Wayne Poyer (Lake Holiday)	The financial burden that will be placed upon all dam operators is extraordinary, perhaps beyond the capabilities of most public and private operators, and is central to compliance at Lake Holiday and all those impacted.	Financial needs of dam owners are recognized. The Board is tasked by the Code of Virginia to maintain regulations that ensure the safe construction, operation, and maintenance of Virginia's dams. The regulations seek to accomplish this in a way that imposes as small a burden as possible on dam owners. Additionally, adjustments to Table 1 of section 50 from the proposed regulations have reduced the costs associated with the regulations. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a

			result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
14	Wayne Poyer (Lake Holiday)	Dam Safety regulations that are not in step with the facility to finance the same reflect a standard that begs non-compliance. To impose these regulations at the state level and not address a means to achieve them does not represent an effective set of policies to achieve a agreeably desired goals.	Financial needs of dam owners are recognized. The Board is tasked by the Code of Virginia to maintain regulations that ensure the safe construction, operation, and maintenance of Virginia's dams. The regulations seek to accomplish this in a way that imposes as small a burden as possible on dam owners. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
15	Wayne Poyer (Lake Holiday)	Contingencies need to be built into the policy that requires the legislature to concurrently provide for funding for the legislation already in place for long term financing for the legislation already in place for long term financing and financial grants.	The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
16	Wayne Poyer (Lake Holiday)	A state-wide cooperative program needs to be incorporated and implemented that minimizes the engineering and construction costs.	The Board's regulatory authority does not extend to regulation of the costs of engineering and construction related to dams. The Department does maintain a list of engineers and engineering firms that have expressed interest in working with dam owners in order to assist dam owners with securing engineering services.
17	Linda and Gerord Korinsky; Raymond and Brenda Crawford; John Martin;	I am not in favor of removing Classification IV from the regulations. These small dams, that have no impact on anyone but the owners, should not be subjected to the expense of a certified engineer.	New section 51 has been added to the regulations; this section contains special provisions for certain low hazard dams, many of which are Class IV dams. While a professional engineer would be required to classify the dam as qualifying for the provisions of the new section initially, no

	Debra Koren; Steven Moore; David Goins; Mark Fendig (Luminaire Technologies, Inc.); Bruce Synder; James and Julie McComb; William B. Lipscomb; Mary Lipscomb; Nathan Pope; Norman W. Richards; Franklin Chamberlain		dam break inundation zone map would be required, nor would subsequent inspections of the dam need to be completed by an engineer so long as circumstances at the dam remain unchanged.
18	Ellen and Phil Winter	These regulations should not be enacted until similar levels of responsibility are placed on both dam owners and those who choose to build or reside in inundation zones.	The Board's regulatory authority does not extend to regulation of downstream property owners. The Department is aware of the issue of downstream development affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem, and as a result, House Bill 837 has been introduced during this year's General Assembly session. This bill would create responsibilities for developers of downstream development to contribute to upgrade costs, grant greater planning and zoning responsibilities to localities, and create notification responsibilities related to dam break inundation zones.
19	Ellen and Phil Winter	All key words and terms should be defined at the beginning of the regulations and used consistently throughout. As currently written, several key words or terms are undefined and different words or terms are used to describe the same, or similar, concepts including: impounding structure, dam, agricultural purpose dams (4VAC50-20-30), dam break inundation zone (4VAC50-20-30), failure of a dam (4VAC50-20-30), spillway (4VAC50-20-30), dam break analysis (4VAC50-20-40), spillway	--The terms "dam" and "impounding structure" were intended to have the same meaning for purposes of the regulation. To ensure clarity, it has been specified in the definition of "impounding structure" that the term is synonymous with the term "dam." --Engineers preparing maps will utilize various flood waves in preparing inundation maps and it is believed that this term should remain flexible for application. --The term "dam breach", when used in the

		design flood (4VAC50-20-260), slopes and crest of embankments (4VAC50-20-105), influence factors (4VAC50-20-105), impounding structure breach (4VAC50-20-58), and flood wave travel times (4VAC50-20-54).	regulations, has been changed to "dam failure" to enhance clarity. --The term "spillway" is defined by section 30 and would include both primary and emergency spillways by the terms of the definition. --The spillway design flood of an impounding structure is determined by use of Table 1, contained in section 50. --The language of section 54(F)(2) has been amended to remove the language concerning "flood wave travel times" discussed in the comment.
20	Ellen and Phil Winter	In 4VAC50-20-40, please insert the words "notwithstanding reasonable precautions taken by those in its inundation zone" in paragraph B, B.1, B.2 and B.3. As currently written, Paragraph B places full responsibility for the safety of others and their properties in inundation zones on the owners of existing impounding structures and therefore is unduly discriminatory and inequitable.	The language used in section 40 pertains to the methods by which an impounding structure is classified into one of the three hazard potential classifications. This language does not purport to impose responsibility for response to emergency situations on any party. While it is acknowledged that all individuals should be prepared to respond to a known threat from an impounding structure, the addition of language addressing downstream parties specifically would not aid the purpose of the section.
21	Ellen and Phil Winter	In paragraph B in 4VAC50-20-40, the word "human" should be added before the word "life".	The word "human" has been added before the word "life" in section 40 to add clarity.
22	Ellen and Phil Winter	Clarification is needed of the terms "probable loss of life", "may cause loss of life", and "no expected loss of life" in 4VAC50-20-40. Absent clear definitions, hazard classification of an impounding structure will vary with the personal opinions of the classifiers as to what these terms mean.	Definitions for the terms "probable loss of life", "may cause loss of life", and "no expected loss of life" have been added to enhance clarity.
23	Ellen and Phil Winter	The concept of a spillway's performance "at a minimum to safely pass" a SDF should be clarified. Does this mean that the spillway capacity is sufficient to prevent overtopping of the impounding structure, including overtopping by wave peaks, but not by the average water/material level, during the Table 1 specified flood?	Generally, "safely pass" means that overtopping of the impounding structure embankment will not occur. However, certain impounding structure designs (e.g., roller-compacted concrete, concrete gravity, etc.) will permit overtopping to occur safely. Flexibility has been left in the regulations to allow for these designs.
24	Ellen and Phil Winter	The appropriate spillway design flood is not determined by Table 1, but through consideration of the factors described in 4VAC50-20-52 on incremental damage assessment.	The appropriate spillway design flood is determined through application of Table 1. The incremental analysis found in section 52 may be applied to further analyze appropriate spillway design and reduce the required spillway design flood where such

			reduction would not increase threats to public safety. The analysis, however, is not mandatory, and the starting point for determining the spillway design flood requirement is Table 1.
25	Ellen and Phil Winter	Concerning Table 1 entries for the SDF, does historical Virginia meteorological and other applicable records on which PMFs are based, confirm that .50 and .75 PMFs significantly exceed the 100-YR flood in all geographic areas of the State, without exception? If not, SDFs for owners of low hazard potential impounding structures will be held, without good reason, to a higher standard than owners of significant and high hazard structures.	The 100-year flood event is far exceeded by the .50 and .75 PMF in all areas of the state, without exception.
26	Ellen and Phil Winter	The primary impetus for these regulations is the need to minimize risks to human life and property; Table 1 entries are illogical and should be changed. For example, despite the lower risk to life and property described in 4VAC50-20-40, significant hazard potential structures with sizes greater than or equal to 50,000 acre feet are held to the same SDF standard as all high hazard structures. The size subcategories shown for significant and low hazard structures, in fact, are not determinative of potential risk to life and property and therefore not of significant importance in establishing a SDF.	Table 1 has been revised to contain uniform spillway design flood requirements for impounding structures of the same hazard classification. It no longer distinguishes among impounding structures based on their size.
27	Ellen and Phil Winter	In 4VAC50-20-52, clarification is needed as to what constitutes an "unreasonable hazard to life and property".	This portion of section 52 has been rewritten and no longer contains the language, "unreasonable hazard to life and property."
28	Ellen and Phil Winter	In 4VAC50-20-52, clarification is needed concerning the "limiting flood condition for incremental damages" and the "evaluation" that is envisioned of this condition. On what basis should engineers conclude the various incremental damages associated with differing SDFs and spillway designs are acceptable or unacceptable?	Section 52 has been amended to include the "Rule of 7s", which specifies that an additional downstream threat is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than zero.
29	Ellen and Phil Winter	In 4VAC50-20-54 paragraph A, the "inundation zone" described in this paragraph as "not further constituting a hazard to downstream life or property" appears inconsistent with that found to constitute an unacceptable threat in 4VAC50-20-52 paragraph C.	The language contained in section 52 and that contained in section 54 address different subjects. The level specified by section 52 is related to spillway design flood requirements and hazard levels. While section 54 does have an impact on hazard classification, the particular language cited by the comment is related to the overall impact of a flood condition,

			without regard to hazard.
30	Randolph W. Bartlett (Fairfax County)	Considering the fact that some of the estimates provided by dam owners indicate repairs may be in the $5-$15 million range per dam, there seems to be inadequate financial support from the state to ensure a successful program.	The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
31	Randolph W. Bartlett (Fairfax County)	The fact that the regulations establish fees to help defray the state's cost of administering the program further shifts the financial burden to local governments and private owners.	Fees have been established pursuant to the authority granted to the board by section 10.1-613.5 of the Code of Virginia. These fees are intended to cover the cost of a small portion of the administration of the Dam Safety program, and have been purposely set at levels that are believed to be as minimal as possible. In fact, the fee amounts provided for by the regulations have been further reduced from the values contained in the proposed regulations.
32	Randolph W. Bartlett (Fairfax County)	Reviewing the estimates in the economic impact analysis, and based on our experiences, we believe that the individual costs for preparing emergency action plans and performing dam breach and incremental analysis are underestimated. Also, based on the preliminary estimates we have received for one of our facilities, we believe that the estimates used in the analysis for repairs to existing facilities are low. If this is correct, the economic impact could be considerably greater than the $250 million cited in the economic impact analysis.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.

33	Randolph W. Bartlett (Fairfax County)	We support the recommendation of using high, low, and significant as the hazard classification which better conforms to current federal terminology.	Table 1 of section 50 of the regulations has been amended to provide three hazard potential classification categories instead of the four categories contained in the current regulations. This brings the regulations into conformance with the standards used by federal agencies and many other states.
34	Randolph W. Bartlett (Fairfax County)	However, we are concerned that the process may be too conservative because if one structure is damaged, the dam will be classified as high hazard. This could result in large expenditures with minimal reduction in loss.	The regulations do not require that an impounding structure be classified as high hazard simply because one structure may be damaged. Rather, the regulations classify impounding structures as high, significant, or low hazard potential based on levels of economic damages (including damages to structures) and threats to human life. A loss of one human life, unlike a single structure, is sufficient to classify an impounding structure as high hazard. The technical advisory committee (TAC) that assisted with the development of the regulations considered the issue of threat to human life extensively. Following those discussions, it was determined that a loss of one human life was unacceptable, and that the regulations should seek to prevent any such loss.
35	Randolph W. Bartlett (Fairfax County)	Another concern along the same lines is that the classification could change if downstream conditions change. This can have significant impacts if the classifications changed after improvements are designed or implemented.	The Board's regulatory authority does not extend to regulation of downstream property owners. The Department is aware of the issue of downstream development affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem, and as a result, House Bill 837 has been introduced during this year's General Assembly session. This bill would create responsibilities for developers of downstream development to contribute to upgrade costs, grant greater planning and zoning responsibilities to localities, and create notification responsibilities related to dam break inundation zones.
36	Randolph W. Bartlett (Fairfax County); Michael	We are concerned that the state does not have a current and/or accurate inventory of all dams that require a state permit. It does not appear that the state has been able to contact all of the affected dam owners and inform	Legislation passed in 2002 significantly increased the number of impounding structures required to be regulated by the Dam Safety Program. Since that time, the Department has been working to update

	Schaefer (Virginia Municipal Stormwater Association)	them of the need to register their dams, or of the requirements in the regulations. We are concerned that many private dam owners are not aware of the proposed regulatory changes and may not have the resources to comply with the regulations as proposed. Considering that some of these dams were constructed as stormwater management facilities required by the MS4 permits, the removal or breaching of such facilities may not be an immediate option. We believe there needs to be a much greater effort to complete the inventory and provide outreach prior to the adoption of more stringent regulations.	Virginia's dam inventory and bring all regulated impounding structures under certificate. Much of this effort has been, and will continue to be, education and outreach to dam owners.
37	Randolph W. Bartlett (Fairfax County)	Specific guidelines should be provided on conducting an incremental analysis. Although the regulations provide more clarity than previously, approval of these analyses still appears to be subjective and without clear criteria. Considering the financial and other impacts to the community if spillway improvements are required to existing dams, or if existing facilities must be removed from service, we believe there should be clearer and more objective criteria.	It is believed that an allowance for engineering judgment in incremental analysis is important. Therefore, the incremental analysis contained in section 52 has been left flexible.
38	Randolph W. Bartlett (Fairfax County)	We believe that the requirement that emergency action plans be exercised does not provide sufficient information as to what is required to meet permit conditions. If a full table top is required utilizing the communities' Emergency Management Agency, the local emergency managers are not sufficiently resourced for all EAPs to be exercised. The regulations are unclear as to if we are required to do an exercise for each facility, or if each owner of a facility is required to do an exercise, or is each community required to do an exercise? Nor do the regulations define who is required to participate in these exercises. This requirement in itself can become quite expensive.	Section 175 of the regulations requires that exercises be conducted for each impounding structure. The language of that section was modified to allow for these exercises to be conducted in combination with exercises for other impounding structures when the involved parties would be the same. Emergency action plan exercises are to be conducted by the dam owner and, to the extent practicable, state and local emergency management agencies (such as the Virginia Department of Emergency Management, local police departments, fire departments, and other emergency services agencies). As explained by the definition of the term "tabletop exercise" in section 30 of the regulations, these exercises are intended to be informal with minimum stress involved. It is not intended for these exercises to impose an undue burden on impounding structure owners.
39	Randolph W. Bartlett (Fairfax	We have a very specific concern that the regulations previously required that earthen embankments be inspected and be cleared of	Section 10.1-609.2 of the Code of Virginia contains the requirements related to the growth of trees and other woody vegetation

	County)	vegetation in order to protect the integrity of the embankment. One section of the proposed regulations requires trees be removed within a distance of 25 feet from the embankment and abutments of the dam. We believe that keeping the embankment and the emergency spillway area clear is appropriate; however we do not believe it is appropriate to specify clearing "within a distance of 25 feet". Many of the stormwater management facilities in urban areas require landscaping, not only for aesthetics, but as part of the treatment process.	on impounding structures and also mandates that such vegetation be removed within a distance of 25 feet of the toe and abutments of the impounding structure. The Board does not have regulatory discretion to vary this requirement.
40	Randolph W. Bartlett (Fairfax County);	Our greatest concern is the financial resources that will be required to bring all spillways up to the new standards. There has been considerable discussion about the cost benefit of the proposed regulations. While we agree that we need to do everything practicable to protect life and property, we also need to determine which financial investments provide the greatest level of protection to the community. We believe the analysis needs to consider the extent of damage and risk that is already occurring during the Probable Maximum Precipitation (PMP) storm, and then consider the additional risk posed by a dam breach. The financial resources required to reconstruct a spillway to reduce the potential of a dam breach during a PMP storm may have a greater return if used to provide flood protection for communities at risk of flooding during the 100 year or less storm.	The Board is charged by the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, with adopting regulations that ensure the safe design, construction, operation and maintenance of Virginia's impounding structures. To that end, the Board must be guided by its mandate and adopt the regulations believed necessary to protect public safety from dam failures.
41	Randolph W. Bartlett (Fairfax County)	In summary, we believe there should be a more detailed analysis of the actual cost of the program and that there needs to be a better program for state assistance. Simply changing the regulations without providing resources and assistance will not provide for a safer environment and spending funds for a minor reduction of water surface during a PMP storm will likely divert funding from correction of more routine flooding issues.	Financial needs of dam owners are recognized. The Board is tasked by the Code of Virginia to maintain regulations that ensure the safe construction, operation, and maintenance of Virginia's dams. The regulations seek to accomplish this in a way that imposes as small a burden as possible on dam owners. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006

			General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
42	John A. Bricker (Natural Resources Conservation Service); Charles E. Horn (Headwaters Soil and Water Conservation District)	In Section 4VAC50-20-30, the definition of "alteration" includes" conducting necessary structural repairs or structural maintenance:. This type of work is performed on an as-needed and recurring basis with most dams. The inclusion of repairs and maintenance into the alteration definition will create unnecessary and cumbersome administrative processes for dam owners and the department as per requirements contained in 4VAC50-20-80. Does this type of work really need to be permitted and/or regulated? We suggest that this wording be deleted from the definition.	Language has been added to section 30 and section 80, which deals with alteration permits, to specifically state that "structural maintenance" (for which a permit is required) does not include routine maintenance. This would effectively clarify that no permit is required for routine maintenance. Overall, the term "alteration" is defined in section 10.1-604 of the Code of Virginia and the Board does not have the authority to vary that definition. As observed by the new language, however, the definition is limited to repairs or maintenance related to the structural integrity of the impounding structure, and is not intended to extend to repairs and maintenance not related to the impounding structure's structural integrity. Section 80 of the regulations additionally provides examples of activities that do require alteration permits.
43	John A. Bricker (Natural Resources Conservation Service)	Sections 4VAC50-20-40 and 4VAC50-20-50 deal with hazard classification and performance standards of impounding structures. We fully agree that impounding structures should be classified based on the potential loss of human life or damage to the property of others downstream. However, the proposed regulations do not make a clear and distinct connection between the hazard classification and the proposed performance standards contained in Table 1. As proposed, the height of the dam, and not only the hazard class, determines the design criteria. If a structure is properly classified according to the potential threat to life and/or property, the height of the dam should not really change or alter the design and performance standards for the structure. Public safety considerations regarding the risk of failure of a significant hazard dam should be the same regardless of structure height. The proposed regulations imply that the public safety considerations for a large significant hazard structure are the same as for a high hazard structure. Based on the hazard class definitions, the public safety considerations are not the same. This is conflicting and confusing information. We	Table 1 of section 50 has been amended to contain uniform spillway design flood requirements for impounding structures in each hazard potential category. It no longer distinguishes among impounding structures based on their size.

		suggest that the design standards should correlate with the hazard classification regardless of the height of the dam.	
44	John A. Bricker (Natural Resources Conservation Service)	Section 4VAC50-20-177 requires an emergency preparedness plan for low hazard dams. This seems to be a requirement for an administrative process without much merit. If the structure is properly classified as a low hazard dam, a failure of the dam would create no expected threat to loss of life and only minimal economic damage to downstream properties. We suggest that this section could be eliminated altogether and thereby relieve some of the administrative burdens on dam owners.	New section 51 has been added to the regulations; this section contains special provisions for certain low hazard dams, many of which are current Class IV dams that cause no expected loss of life and no economic damage to anyone but the owner. This new section does remove the Emergency Preparedness Plan requirement for those dams. For other low hazard dams that may cause economic damage to others, the Emergency Preparedness Plan requirement has been maintained. Still, the plan is designed to be compiled by the dam owner with limited to no expense involved.
45	Dr. Peter G. Rainey	Capacity should be determined by inflow hydrographs. The computation of an inflow hydrograph is a function of the watershed characteristics, while an outflow hydrograph is both function of inflow and dam design, including reservoir characteristics, dam height, spillway characteristics, and gate(s) operating procedures. The setting of SDF design based on the outcome of that design is circular logic. "The owner's engineer must develop PMF hydrographs for 6-, 12-, and 24-hour durations. The hydrograph that creates the largest peak ~~ouflow~~ inflow is to be used to determine capacity for nonfailure and failure analysis".	Inflow does not necessarily equate with peak pool elevation. In contrast, peak pool elevation will equate with peak outflow. The technical advisory committee that assisted with the development of the regulations discussed this topic and it was determined that peak outflow was the appropriate criteria.
46	David Campbell (Schnabel Engineering)	Dam failures can indeed worsen the consequences of extreme flood events. Where the failure of an impounding structure due to inadequate spillway capacity can be shown to significantly increase the severity and/or extent of flood impacts, the provision of sufficient spillway capacity for passing a probable maximum flood will ultimately prevent injuries and the loss of additional lives, and prevent significant additional damages to property.	It is agreed that the PMF is an appropriate impounding structure design criteria and that designing impounding structures to this standard can help prevent additional loss of life and property, even in extreme flood events. Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States

			history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942).
47	David Campbell (Schnabel Engineering)	If the extent of additional flooding resulting from a dam failure can be shown to be small for extreme flood events, then the Department has provided a process whereby lesser spillway flood passage criteria can be applied (proposed incremental damage assessment: 4VAC50-20-52).	The incremental analysis, which is found in section 52 of the regulations, is the method by which a lesser spillway design flood requirement can be utilized for an impounding structure where it can be shown that designing to a lesser spillway design flood will not unacceptably increase hazards to life and property.
48	David Campbell (Schnabel Engineering)	The presence of an emergency response document, together with a commitment to undertaking drills and exercises, is not sufficient to prevent or mitigate disaster. However, preparedness in knowing available options and opportunities in advance and having simulated extreme events will, by definition, make critical knowledge more readily available, enhance communications, define action plans to be implemented in the absence of available communications, and improve decision making and decision support under stressful, rapid-response conditions. Prepared owners and responders do indeed derive purposeful benefits, even under extreme circumstances.	It is agreed that Emergency Action Plans (EAPs) can help mitigate and prevent losses of life and property in emergency situations. Requirements for EAPs for high and significant hazard impounding structures is contained in section 175 of the regulations, while requirements for Emergency Preparedness Plans for low hazard impounding structures (which are lesser than full EAPs due to the lesser threat posed by low hazard structures) are contained in section 177.
49	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.); William Monroe (Augusta County Service Authority)	The term "planned land-use" is used several places in the regulations. Is this intended to be total build out condition in accordance with a valid comprehensive plan? Could this term be defined?	To increase clarity, a definition of "planned land use" has been added to the definitions section (section 30) of the regulations. The current definition is "…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."
50	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	4VAC50-20-54 B. Extending inundation mapping to a point downstream where the water surface elevation level of the SDF with a failure is within 1-foot of the water surface elevation level of the SDF without a failure appears excessive. Extending the mapping to a point where the two conditions converge to within 2 to 3 feet should be adequate for the extreme events that are being considered (PMF to 100-year).	It is believed that mapping to one foot increments is appropriate. This threshold also maintains consistency with the Commonwealth's floodplain program.

51	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	4VAC50-20-54 B. Is it the intent of the regulations to require mapping to include profiles and cross sections in addition to the plan of the inundation mapping? If so, what is the purpose of providing profiles and cross sections on the inundation mapping? The modeling input data will include profile and cross section information, but the inundation mapping should not be required to include cross sections and profiles.	It is not the intent of the regulations to require cross sections in mapping. Language contained in section 54 indicating that cross sections are required has been removed. Water surface profiles are required to show the depth of inundation.
52	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	4VAC50-20-40 C. Requires a dam break analysis by an engineer to support the appropriate hazard category, yet 4VAC50-20-54 E, states that low hazard potential impounding structures do not require an engineer to prepare the inundation mapping. This appears to be a contradiction as the evaluation to support a dam category of "low hazard" must be supported by a dam break analysis that includes the downstream inundation areas. A professional engineer should be required for all inundation mapping, irregardless of the dam category.	As amended, the regulations now require all dam break inundation zone mapping for hazard potential determinations to be prepared by a licensed professional engineer, except for those dams exempted from that requirement by new section 51 (which still requires an engineer's certification).
53	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	4VAC50-20-54 F.2. States that a note must be placed on all maps that includes the statement "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". This is the only place in the regulations that mentions flood wave travel time on inundation mapping. The regulations need more direction as to what is desired and required for flood wave travel time on the inundation mapping.	The language of section 54(F)(2) has been amended to remove the language discussed in the comment.
54	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	The economic impact statement asserts the cost for inundation mapping is anticipated to average $16,417 each. This is too low to prepare the level of detail that appears to be required by the regulations. (1)The inundation mapping must extend until the increase is water surface elevation level during the SDF with a failure is less than 1-foot greater than the water surface elevation level of a SDF without a failure. This requirement will require long reaches to be mapped. (2)Detailed survey is required, but the regulations do not specify what constitutes a detailed survey. Does the survey effort required for inundation mapping need to meet the FEMA	Cost estimates for inundation zone mapping were developed by obtaining estimates from engineering firms that perform work on impounding structures across the Commonwealth. It is believed that the information contained in the economic impact analysis is accurate. It is recognized that mapping and other costs can vary across different types of impounding structures due to factors such as a broad range of sizes, inundation zones, watersheds, and downstream affected properties.

		requirements for Flood Insurance Study mapping? (3)Each structure located within or near the inundation zone will need to be located and its first floor elevation shot. (4)The cost to prepare the inundation mapping must reflect the time and care that must be taken in their preparation due to their critical use in emergency situations.	
55	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	The regulations do not provide any guidance as to the study survey requirements. Inundation mapping is similar to the FEMA flood insurance studies. Should FEMA survey requirements for flood insurance studies mapping development be required?	The regulations have been drafted to allow flexibility for an engineer to use the best available information. It is not intended that FEMA flood insurance study survey requirements be required.
56	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	4VAC50-20-175 G.7. Dam owners are not equipped for rapid notification of downstream residents in the event of an emergency. This notification is usually performed by the locality's EMS. What will the Emergency Action Plan process be if the locality refuses to sign the plan accepting any responsibility for notification?	All emergency action plan requirements are the responsibility of the impounding structure owner. In the event that arrangements for notifications by a locality cannot be made, this includes arranging for the notification of downstream residents in an emergency situation. It is the Department's experience, however, that localities are willing to offer whatever assistance they are able to in an emergency situation.
57	David Henderson (Hayes, Seay, Mattern & Mattern, Inc.)	A lot of problems with inadequate operation and maintenance of dams in the past has occurred due to lack of financial resources on the part of dam owners. Has any consideration been made to require prospective new dam owners to show adequate financial ability and commitment (similar to that required by sanitary landfill owners) to properly operate and maintain a dam after construction; prior to issuing a permit to construct?	The Board's regulatory authority over construction of impounding structures is limited to the actual construction of the impoundment. The Board does not have regulatory authority over the financial abilities of dam owners. All impounding structures, including those newly constructed, must obtain necessary permits and fulfill the requirements of an operation and maintenance certificate once constructed.
58	Charles E. Horn (Headwaters Soil and Water Conservation District)	4VAC50-20-54. Dam Break Inundation Zone Mapping: The proposed requirement for dam break inundation zone mapping is expected to cost the district $131,336 using the estimated per dam cost in the economic analysis. Conservation Districts are subdivisions of state government and have no revenue powers to raise funds. We question our ability to comply with this.	It is recognized that dam break inundation zone mapping requirements may impose additional costs on dam owners. The maps, however, are integral to making accurate determinations of hazard potential classification, and in developing and maintaining an accurate emergency action plan, both extremely important considerations in ensuring the safe design and operation of an impounding structure. As such, all dam owners are treated equally, whether private or public, including Soil and Water Conservation Districts.

59	Charles E. Horn (Headwaters Soil and Water Conservation District)	The Headwaters Soil and Water Conservation District acknowledges that the proposed regulations have the potential to improve public safety.	Public safety is the primary concern of the proposed regulations pursuant to the Board's mandate under § 10.1-605 of the Code of Virginia. The Board's policy of protecting public safety is noted in the regulations, both existing and proposed, in section 20(A).
60	Charles E. Horn (Headwaters Soil and Water Conservation District)	4VAC50-20-105 B. In all places where "owner" is used, the wording should be changed to read the owner or owner's certifying engineer shall…	The owner is the sole party responsible for the operation and maintenance of their impounding structure. This responsibility cannot be delegated to a professional engineer. It is important that all submittals for certificates come directly from the owner of the impounding structure.
61	Charles E. Horn (Headwaters Soil and Water Conservation District)	4VAC50-20-175 E. Headwaters Soil and Water Conservation District acknowledges the benefit of drills and table top exercises for emergency planning. However, to conduct a drill each year for eleven (11) dams will strain the resources to the breaking point of not only the district but each of the paid and volunteer fire and rescue organizations that would need to participate annually. The three year requirement for table top exercises, while less often, will still tax the resources of all participating. We suggest that a table top exercise be conducted once per permit duration (no more than once every two years for conditional and once every six years for regular permits). We also suggest that only one drill per permit duration be required (no more than once every two years for conditional and once every six years for regular permits). We further believe that one drill dealing with the emergency personnel should meet the requirement of all the dams in that department's response area. In our situation a drill per dam means five drills for just one fire department and will lead to the "cry-wolf syndrome".	The drills required by section 175 test, develop, or maintain skills in an emergency response procedure. During a drill, participants perform an in-house exercise to verify telephone numbers and other means of communication along with the owner's response. This in-house exercise is intended to ensure that each EAP remains up to date and that those having responsibilities under it are able to carry out their duties. A drill is not intended to be an onerous requirement or to require excessive effort on the part of third parties. The language of section 175 was modified to allow emergency action plan exercises to be conducted in combination with exercises for other impounding structures when the involved parties would be the same. Emergency action plan exercises are to be conducted by the dam owner and, to the extent practicable, state and local emergency management agencies (such as the Virginia Department of Emergency Management, local police departments, fire departments, and other emergency services agencies). As explained by the definition of the term "tabletop exercise" in section 30 of the regulations, these exercises are intended to be informal with minimum stress involved. It is not intended for these exercises to impose an undue burden on impounding structure owners.
62	Charles E. Horn (Headwaters	4VAC50-20-175 F. The existing monitoring and warning equipment in our district is part of the National Weather Service Integrated	The language of section 175(F) has been amended to recognize the maintenance responsibilities of the Virginia Department

	Soil and Water Conservation District)	Flood Observing and Warning System (IFLOWS). The maintenance is handled by the Virginia Department of Emergency Services. They have decided to reduce their testing from twice a year to once a year. The actual ownership of the IFLOWS has not been determined. The Headwaters Soil and Water Conservation District questions how this regulation can hold it responsible for testing of equipment owned and serviced by a different agency.	of Emergency Management for IFLOWS installed on Soil and Water Conservation District-owned dams and to specify that testing of such systems may be performed at the intervals set by VDEM.
63	Charles E. Horn (Headwaters Soil and Water Conservation District)	4VAC50-20-180 D. The term "damage" is open to considerable interpretation and should be further defined to exclude minor erosion that can be fixed and seeded immediately without powered equipment.	Defining "damage" to exclude minor erosion would likewise be subject to considerable interpretation. All erosion in an emergency spillway should be addressed properly. Should erosion be minor and able to be handled during normal maintenance, it is anticipated that a professional engineer could perform necessary inspections and sanction such work without a large amount of time, review, or expense.
64	Edward L. Priestas (Henrico County)	The proposed changes place a considerable burden on current owners of dams to upgrade their facilities. While there is provision for owners with facilities operating under current operation and maintenance certificates, there does not appear to be provision for owners of facilities not currently in compliance.	For impounding structures that do not receive a delayed effective date, the Board will continue to utilize the existing conditional certificate process, which emphasizes progress by an impounding structure owner toward coming into compliance with regulatory standards. This process allows the particular situation of each impounding structure to be considered independently and for achievable timelines to be set.
65	Edward L. Priestas (Henrico County)	It is understood that facilities not yet regulated but which exceed the threshold for regulation must first apply for a conditional operation and maintenance certificate. The timeline for the conditional operation and maintenance certificate is for a maximum term of two years.	Impounding structures that are not currently under regulation but meet all regulatory requirements do not need to initially apply for a conditional certificate, but may instead apply for a Regular Operation and Maintenance Certificate. Impounding structures that do not meet the requirements of the regulations must apply for a Conditional Operation and Maintenance Certificate. The maximum term of these certificates is two years, as noted by the comment.
66	Edward L. Priestas (Henrico County)	4VAC50-20-155 states that the Board may extend a Conditional Permit provided that the owner is proceeding with the necessary corrective actions. There does not appear to be any maximum length of time that	The Board examines applications for extensions to conditional operation and maintenance certificates on a case-by-case basis. In cases where only an extension of a term of months is necessary to complete

		extensions may be granted. In light of the extensive costs involved in upgrading some facilities to meet the new standards is it not reasonable to state that owners making progress toward correcting deficiencies may request an extension of the current conditional certificate on one year increments? The total number of extensions not to exceed the time allowed owners holding current operation and maintenance certificates to comply with the new standards based on the hazard potential classification.	necessary upgrades and repairs, the Board limits its extension accordingly. It is believed that extensions should continue to be examined on a case-by-case basis and that placing an established time on each extension without consideration of actual site conditions would be inappropriate.
67	Brooks Smith (Hunton and Williams on behalf of the Virginia Manufacturers Association)	The definition of "impounding structure" could be interpreted to encompass such impoundments [captive industrial waste impoundments] ("used to retain or store waters or other materials"). We do not believe that such an interpretation would be appropriate and we ask that DCR clarify in the final regulations that captive industrial waste impoundments are not covered.	Unless an impounding structure fits within one of several exceptions to the definition of "impounding structure" contained within the Dam Safety Act (§10.1-604 et seq.), all impounding structures that are at least 25 feet in height and create a maximum impoundment capacity of 15 acre feet or greater, or that are at least 6 feet in height and create a maximum impoundment capacity of 50 acre feet or greater are required to be regulated by the Board. The Board does not have the authority to create additional exceptions to this Code requirement.
68	Geoffrey L. Cowan (Dewberry & Davis. LLC)	I recommend that wherever possible specific technical criteria be removed from the regulations and place in guidance documents. One reason for this is that once specific technical criteria becomes part of a regulation, the ability to amend or possibly even "correct" the criteria, based on newer or more technically accurate information, becomes difficult to accomplish in a timely fashion.	Due to the requirements of administrative law in Virginia, any criteria wished to be enforced must be placed in regulations that undergo the Administrative Process Act procedures for adoption. While placing technical criteria in guidance documents would allow for easier updating and correction, it would also have the undesired effect of making the use of such criteria unenforceable.
69	Geoffrey L. Cowan (Dewberry & Davis. LLC)	It is recommended that the threshold criteria related to incremental damage analysis (IDA) be placed in a guidance document providing detailed technical IDA procedures rather than appearing in the regulations. One good example of the approach is the guidance document for performing incremental damage analysis found in the "Ohio Critical Flood Guidelines". The threshold criteria and technical guidance provided in this document are clearly presented an in keeping with industry standards and I recommend that something similar be considered for Virginia.	Due to the requirements of administrative law in Virginia, any criteria wished to be enforced must be placed in regulations which undergo the Administrative Process Act procedures for adoption. While placing technical criteria in guidance documents would allow for easier updating and correction, it would also have the undesired effect of making the use of such criteria unenforceable. It is believed that the components of the incremental analysis which need the force of regulation have been included in the regulations. This does not prevent the

			issuance of guidance in the future to further assist with explaining the application of the incremental analysis.
70	Geoffrey L. Cowan (Dewberry & Davis. LLC)	Whether or not the IDA threshold criteria presented in section 4VAC50-20-52 C is removed from the proposed regulations, the thresholds should relate to the incremental increase in water surface elevation and velocity associated with the non-failure and failure scenarios for a particular design storm, which is in keeping with the IDA guidelines presented in both the "Federal Guidelines for Dam Safety: Selecting and Accommodating Inflow Design Floods for Dam, FEMA 94" and the "Ohio Critical Flood Guidelines". The current wording in the proposed regulations does not clearly refer to the incremental increase in flood depth or velocity.	The language contained in section 52, which has been amended, now contains the "Rule of 7s", which specifies that an additional downstream threat is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than seven. This specification is believed to be adequate for inclusion in the regulations. This does not prevent the issuance of guidance in the future to further assist with explaining the application of the requirements of the regulation.
71	Geoffrey L. Cowan (Dewberry & Davis. LLC)	It is recommended that specific technical criteria related to development of spillway design floods, such as the required storm durations proposed in section 4VAC50-20-50D, be removed from the regulations and placed in a guidance document concerning SDF development.	Due to the requirements of administrative law in Virginia, any criteria wished to be enforced must be placed in regulations which undergo the Administrative Process Act procedures for adoption. While placing technical criteria in guidance documents would allow for easier updating and correction, it would also have the undesired effect of making the use of such criteria unenforceable. It is believed that the components of spillway design flood development that need the force of regulation have been included in the regulations. This does not prevent the issuance of guidance in the future to further assist with explaining the application of the requirements of the regulation.
72	Irwin Stanton	It is my opinion that the regulation of high risk impoundments focuses too much on dealing with PMF induced impacts at the expense of addressing preventative measures for the so called "sunny day breach". As one whose family and friends live in an inundation zone, I am more concerned about he sudden breach than what would happen as a result of a PMF event. The meteorological event triggering a PMF will provide warning that coupled with an emergency notification system, will likely give me time to move to higher ground before all avenues of travel are	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-

		flooded.	Atlantic region (Smethport, PA in 1942). As to non-flood events, the regulations require that impounding structures be constructed according to one of several sets of criteria contained in section 320. The regulations also contain requirements related to design and maintenance of impounding structures and require inspections by a professional engineer at intervals between two and six years depending on the hazard classification of the impounding structure. These requirements aim to provide protection from sunny day dam failures.
73	Irwin Stanton	One should remember that most modes of transportation have storm systems designed for 10 to 100 year events at best.	The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq.) is to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. While other types of infrastructure may be designed to criteria different than that required for impounding structures, the Board must set forth the requirements that it believes are necessary to carry out its mandate pursuant to the law.
74	Irwin Stanton	It is my opinion that dams whose sudden failure would cause loss of life should be closely monitored for changes in piezometric surface within the dam or indication of sediment bearing leakage that would indicated piping/erosion within the dam.	It is recognized that piezometric monitoring of an impounding structure is desirable and the Board supports its use in appropriate cases. Such monitoring, however, is impracticable for many dam owners, and especially for those owning impounding structures that were constructed without the installation of this technology. Therefore, piezometric monitoring has not been included in the regulations as a requirement. The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq. of the Code of Virginia) is to enact regulations that ensure the safe design, construction, operation, and maintenance of Virginia's impounding structures. The regulations have been developed in pursuit of this mandate, and all requirements believed necessary to accomplish this goal have been included.
75	Irwin Stanton	The ability of an impoundment to withstand runoff from a PMF provides no assurance against a sunny day collapse.	With respect to failures under non-flood conditions, or "sunny day dam failures", the regulations require that impounding structures be constructed according to one of several sets of criteria contained in section 320. The regulations also contain

			requirements related to design and maintenance of impounding structures and require inspections by a professional engineer at intervals between two and six years depending on the hazard classification of the impounding structure. These requirements aim to provide protection from sunny day dam failures.
76	Irwin Stanton	I believe that owners of high or significant risk class impoundments not only have the ability and financial resources to provide monitoring, but an obligation to their neighbors in the inundation zone to provide a means to detect possible sudden failure and prevent that failure by having the ability to lower the impoundment level until repairs are made to the structure. It is respectively suggested that monitoring of high and significant risk impoundments be expanded to include active monitoring within the structure, an emergency response plan if a problem is detected and require a means to lower the level of the impoundment until the structure is further evaluated and repaired.	Requirements for monitoring within an impounding structure, such as piezometric monitoring, are discussed in comment 74 above. The regulations do require routine inspections by both the dam owner and, where appropriate, a professional engineer. Should deficiencies be identified, the regulations require that the owner take actions specified under their required emergency action plan or emergency preparedness plan, and that the deficiencies be addressed as necessary.
77	Louis Panebianco	Why not help Virginians bring the existing dams into compliance before imposing additional burdens?	The Board is charged by the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, to adopt regulations that ensure the safe design, construction, operation and maintenance of Virginia's impounding structures. In conducting this revision to the regulations, which were last reviewed comprehensively in 1989, the Board must be guided by its mandate. While it is recognized that many impounding structures still need additional work to become compliant with current requirements, waiting to adopt proper standards will do little more than cause these structures to undergo two upgrades instead of one (one in order to meet current standards, and then another to meet revised standards at a later date should the standard be increased). This would increase the overall burden to impounding structure owners. To assist impounding structure owners with compliance, the Department continues to seek additional staffing in order to provide additional outreach and guidance. The Department also continues to advocate for funding for the Dam Safety, Flood

			Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
78	Louis Panebianco	Our country's highway system does not even have to meet your proposed standards.	The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq.) is to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. While other types of infrastructure, including highways, may be designed to criteria different than that required for impounding structures, the Board must set forth the requirements that it believes are necessary to carry out its mandate pursuant to the law.
79	William Monroe (Augusta County Service Authority)	4VAC50-20-52. As written this appears to only apply to existing dams that do not need any maintenance – eventually, all dams will be required to perform some maintenance at which time it appears they would have to expand to the SDF without exception.	Section 52 has been amended to remove the language that is cited by the comment. The intent of the regulations, as well as the revised language, is for the incremental analysis to be available to all impounding structure owners. Other requirements for maintenance, inspections, and emergency action plans are contained in other sections of the regulations.
80	William Monroe (Augusta County Service Authority)	4VAC50-20-52. There are references in each of these sections related to water depths where the limits are 1 to 2 feet and velocities within 3 feet per second. With the level of accuracy associated with some mapping sources and the modeling software, these tolerances may be very difficult to meet with confidence.	The language contained in section 52, which has been amended, now contains the "Rule of 7s", which specifies that an additional downstream threat is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than seven. It is believed that the tolerances specified can be met. It is also of note that conducting an incremental analysis is not a requirement of the regulations, but rather an option for the dam owner.
81	William Monroe (Augusta County Service Authority)	4VAC50-20-175. What is expected from the remote sensing equipment tests? If the equipment is maintained by contract under IFLOWS, is this sufficient?	The tests required by section 175 are intended to ensure that remote sensing equipment is functioning as designed so that it works properly at all times. Section 175 has been amended to specify that equipment maintained by the Virginia Department of Emergency Management

			(VDEM), such as IFLOWS, may be tested according to a schedule developed by VDEM.
82	William Monroe (Augusta County Service Authority)	4VAC50-20-175. Keeping track of every individual owner, lessee, etc. takes a significant continuous effort. Using reverse 911 systems would be preferred. The use of cell phones is making efforts more difficult for any process employed.	Section 175 has been amended to clarify that systems such as reverse 911 may be utilized. The dam owner is responsible for developing a notification chart demonstrating how parties affected by a dam failure will be notified; use of reverse 911 is just one method that may be utilized by a local emergency services department to achieve notification of downstream residents, if that responsibility is assigned to the emergency services department.
83	William Monroe (Augusta County Service Authority)	4VAC50-20-175. The owner is made fully responsible for development of the EAP. Will there be feedback from the Department on whether it is deemed to be sufficient?	All emergency action plans are required to be submitted to the Department, both by section 175 and by section 105, which explains how a Regular Operation and Maintenance Certificate is applied for and obtained. The Department will review all EAPs for sufficiency.
84	William Monroe (Augusta County Service Authority)	4VAC50-20-175. Have all state and local officials been made aware of the frequency of meetings associated with the regulatory requirements and can owners expect full cooperation? The number of meetings (when looking at all dams in a locality) could cause a significant strain on staffing at both the state and local level (something of which the owner has no control) creating a potential violation condition for dam owners.	Section 175 of the regulations requires that exercises be conducted for each impounding structure. The language of that section has been modified to allow these exercises to be conducted in combination with exercises for other impounding structures when the involved parties would be the same. Emergency action plan exercises are to be conducted by the dam owner and, to the extent practicable, state and local emergency management agencies (such as the Virginia Department of Emergency Management, local police departments, fire departments, and other emergency services agencies). The absence of a state or local official will not create a violation by the owner if that official's participation is not practicable.
85	William Monroe (Augusta County Service Authority)	4VAC50-20-320. In the past I have had difficulty locating applicable references from the sources listed. Are there specific titles that can be provided by the Department that would assist with locating and identifying appropriate source materials similar to what is done in 4VAC50-20-330?	It is understood the information necessary from the sources listed in section 320 may not be readily apparent without further specification. While the list of reference materials is greater than felt appropriate to be contained within the regulations, the Department is considering issuing guidance or posting to its website further explanatory information regarding these sources.
86	William	Better define economic impact.	Requirements in the regulations that would

	Monroe (Augusta County Service Authority)		cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
87	Michael Moon (City of Manassas)	It is understood that many of the changes that are proposed reflect changes in the industry at both the State and federal level that will better identify the risks inherently associated with dam construction. The requirements to put into place emergency action plan development and clarification of terminology along with the requirement to perform dam break analysis and notify persons and property located within potential dam break inundation zones are much needed enhancements to the regulations.	It is agreed that Emergency Action Plan development and implementation will enhance public safety. It is also agreed that the performance of dam break analyses will provide for accurate hazard potential classifications and supply the owner and others with information necessary to define the area that will be affecting by the failure of the impounding structure.
88	Michael Moon (City of Manassas)	The current regulations rely on the judgment of competent and experienced professional engineers to evaluate the dam classification in the context of various factors that apply to each dam design, including risk that should weigh heavily into dam safety evaluations. The revised Table 1 takes this discretionary aspect out of the process which will not allow the flexibility that has been used in the past successfully throughout the Commonwealth.	While Table 1 has been revised to set minimum requirements for spillway design, the regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "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." It is expected that engineering judgment will still be applicable to areas including, but not necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
89	Michael Moon (City of Manassas)	The second issue in reference to the implementation strategy is concerning from a cost standpoint and does not mirror similar initiatives in other areas of infrastructure improvement. The State regulates building construction under the Uniform Statewide Building Code (USBC), which requires an owner to maintain a building in conformance to the Code that existed at the time of permit issuance. The owner does not have to update to current codes until such time that he performs new work on the structure. This is to protect the owner from costly upgrades every time the Code changes. Another public example is when roads are constructed they have to meet the Code in existence at the time. Every road cannot be updated to new standards every time a new design criteria is placed into effect because this would be cost prohibitive.	It is understood that other types of infrastructure are not required to upgrade each time that standards are changed. In the case of impounding structures, however, public safety, which is the sole concern of the regulations, is directly impacted by the standards in place. To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period.
90	Michael Moon (City of Manassas)	It must be recognized that funding is usually a factor which must be considered alongside risk when making decisions concerning rehabilitation of the nation's infrastructure. Upgrading dams to meet current design standards can often be cost prohibitive and in some cases unwarranted if a significant improvement in public safety is not achieved.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an

			incremental damage analysis (section 52) to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
91	Michael Moon (City of Manassas)	The City would like to see a distinction in the regulations for new dams and existing dams and to see the current regulations stay in place under Section 130 that provides for exemptions for dams that were constructed prior to July 1, 1982 that do not pose and unreasonable hazard to life and property.	To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period. Additionally, the language that was previously contained in section 130 of the regulations has been relocated to section 52, which contains the incremental damage analysis. This new section would allow the old section 130 process to be applied to all dams, including those constructed prior to 1982.

92	Michael Moon (City of Manassas)	The City's dam is one of only nineteen (19) Class 1 risk dams in the state whose sole purpose is to operate as a water supply reservoir. We are being requested to spend almost $10 million in funds to achieve a full PMF storm design. This will result in higher water rates for our residents and businesses. If the dam regulations are not changed to provide relief to the City it is requested that the Board works closely with the Legislature and Governor on a funding strategy to assist localities that are impacted adversely by adhering to the new regulations.	The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
93	Ralph Hollm	Treating old and new dams alike may help regulators but that would be completely contrary to the well established safety criteria used in the rules and regulations applicable to everything from highways to homes.	It is understood that other types of infrastructure are not required to upgrade each time that standards are changed. In the case of impounding structures, however, public safety, which is the sole concern of the regulations, is directly impacted by the standards in place. To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period.
94	Ralph Hollm	It is most discouraging to see the deletion of the safe, flexible and sensible features of 4VAC50-20-50 b: "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	While Table 1 has been revised to set minimum requirements for spillway design, the regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "design, inspection and maintenance of impounding structures shall

		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."	be conducted utilizing competent, experienced, engineering judgment that takes into consideration factors including but not limited to local topography and meteorological conditions." It is expected that engineering judgment will still be applicable to areas including, but not necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
95	John Taylor (Crab Orchard Creek Reservoir)	I would like you to consider that, if you do put in an application fee, and if it's a good application and it progresses satisfactorily that it would be a one-time fee, rather than implemented on a yearly basis.	The fees contained in the regulations are due on a cyclical basis. The amounts of the fees, however, have been reduced from the amounts contained in the proposed regulations. It is believed that the fee levels set will be manageable for dam owners.
96	John Taylor (Crab Orchard Creek Reservoir)	I would request that while maintaining the requirement for demonstrating safe structures that the requirement for costly completion models not be mandated, but used only when required and that language be included to encourage the Board to consider less costly alternatives when these are available.	It is believed that the information required to be developed by the regulations, including impounding structure inundation zone maps and computer routings, is the least costly method reasonably available to accurately classify and design impounding structures.
97	John Taylor (Crab Orchard Creek Reservoir)	The classification of the Class I or the Class II or the significant situation seems to unreasonably propose regulations that again are going to require computer generated information. I think in many cases less costly alternatives are available.	It is believed that the information required to be developed by the regulations, including impounding structure inundation zone maps and computer routings, is the least costly method reasonably available to accurately classify and design impounding structures.
98	John Taylor (Crab Orchard Creek Reservoir)	If computer generated information is required, that is going to exclude some of the "normal" professional engineers as listed on the department's schedule as far as being available to help dam owners. The only people with access to these extremely expensive programs are people like Thompson and Litton and Dewberry and Davis.	It is believed that the computer programs necessary to mapping will be able to be obtained by all interested engineers. HEC-1, which is one program capable of performing such work, is available for free from the U.S. Army Corps of Engineers.
99	John Taylor (Crab Orchard Creek Reservoir)	I would respectfully request than consideration be given to some type of individual income tax relief to be included in these changes. I have discussed the deductibility of these expenses as my property of 320 acres is an actively managed tree farm. Unless the legislature would recognize the mandatory nature of these expenses, that the only way of recouping this expense would be to sell the property.	The Board's regulatory authority under the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, is limited to ensuring the safe design, construction, operation, and maintenance of Virginia's impounding structures. The Board does not have authority over tax matters or the deductibility of costs incurred in dam maintenance, which is an issue that would have to be considered by the General Assembly.
100	John Taylor	I note with some alarm the requirement for a	An analysis without a dam failure is

	(Crab Orchard Creek Reservoir)	dam owner to provide analysis of the situation where a dam passes the PMF without failure and to document the local conditions pertaining at the time. Passage of the PMF (following redesign of the spillway) would mean the dam had performed one of its purposes successfully (i.e. mitigation and assisting with flood control), but there would still exist clearly a considerable local problem. It would be of great concern locally but it is surely not fair to impose the cost of detailed hydrological analysis of the total drainage on an individual dam owner?	necessary, for comparative purposes, to determine the impact of a dam failure during a flood event. This information is needed to properly determine hazard classification and to plan for emergencies at the impounding structure. It may also be utilized by a dam owner in conducting an incremental damage analysis. As it is the impounding structure that is capturing water that will be released by a failure, it is equitable to require the owner to develop the data necessary to demonstrate the impact of a failure.
101	Gregario Vigilar (GKY & Associates, Inc.)	Inundation mapping. The location of the end of inundation mapping should be indicated where the water surface elevation of the dam break inundation zone (Is this based on a PMF or on the spillway design flood?) and the water surface elevation of the spillway design flood for a non-dam failure event converge within one foot of each other. What is the purpose of comparing the two inundation zones? Is it to assess the difference in flooding when the dam holds and when it fails? If so, for a valid comparison, we need to use the same flooding event in both cases, e.g., if you're designing the spillway for a 0.9 PMF, then the dam break analysis should be performed also for a 0.9PMF. Is this correct?	Section 54 of the regulations, as amended, contains requirements for mapping of both the PMF and the spillway design flood of the dam in order to allow for comparisons. Mapping of the spillway design flood and the PMF, as well as mapping of a dam with and without a failure, is necessary for comparative purposes to determine the impact of a dam failure during a flood event. This information is needed to properly determine hazard classification and to plan for emergencies at the impounding structure. It may also be utilized by a dam owner in conducting an incremental damage analysis.
102	Gregario Vigilar (GKY & Associates, Inc.)	Incremental damage assessment (4VAC50-20-52). 5. The applicant demonstrates...that the impounding structure...does not pose an unreasonable hazard to life and property. How do you define "unreasonable hazard"? If the dam is not able to handle the PMF without overtopping, does it pose an unreasonable hazard?	Section 52 has been revised and now adopts the “Rule of 7s”, which specifies that an additional downstream threat to persons or property is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than seven.
103	Gregario Vigilar (GKY & Associates, Inc.)	Can you still proceed with IDA using a smaller design flood, if the existing structure does not pass the PMF in the first place? If it doesn't pass the PMF, do we redesign the spillway so that it does? Is it only after developing an adequate PMF design that we can proceed with IDA?	The incremental analysis may be performed if the existing structure will not pass the PMF; however, the engineer will still need to determine that a reduced spillway design will not present an additional downstream threat.
104	Michael Schaefer	The definitions of the three proposed hazard potential incorporate and rely upon vague	To increase clarity, a definition of “planned land use” has been added to the definitions

	(Virginia Municipal Stormwater Association)	standards. For example, the difference between the three classifications may depend upon whether the degree of economic damage in event of dam failure is "serious" (high hazard), "appreciable" (significant hazard) or "minimal" (low hazard). In addition, the proposal requires "planned land use" to be considered when making a hazard classification. VAMSA members are concerned of the potential difficulty of applying these qualitative and fairly subjective standards in practice, particularly given the potentially significant regulatory and cost ramifications of the classification.	section (section 30) of the regulations. The current definition is "…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 difficulties in establishing a firm threshold statewide and a need to allow for engineering judgment to make determinations on a case-by-case basis, terms relating to levels of economic damage have been left flexible. Other factors to be considered in hazard potential determinations, however, have been given additional definition in section 40 of the regulations. These include "probable loss of life", "may cause loss of life", and "no loss of life expected."
105	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 50: Performance Standards This section revises spillway design standards and eliminates the existing exemption for facilities constructed before July 1982. While VAMSA agrees with the concept of everything practicable to protect life and property, VAMSA is concerned with the financial burden on Virginia localities, and ultimately its citizens, that will be required to bring all spillways up to the proposed standards.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis (section 52) to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1,

			2007 and February 1, 2008.
106	Michael Schaefer (Virginia Municipal Stormwater Association)	The Board should also consider the financial burden in the context of the most significant needs of citizens and whether this regulation allocates funds appropriately. With respect to the performance standards, VAMSA recommends that the regulations factor in the extent of damage and risk that is already occurring during the PMF storm, and then consider the additional risk posed by a dam breach. For example, in areas already subject to flooding during say, the 100-year storm, the incremental damage from dam failure may be insignificant compared to the damage inflicted by the storm itself. VAMSA is concerned that the regulation may be too prescriptive, and thereby, direct limited local resources to addressing spillway designs for major storms and interfere with the ability to correct more likely problems.	Section 52 of the regulations contains the incremental damage analysis, which will allow the spillway design flood requirement for an impounding structure to be reduced where it can be shown that a lesser design capacity would not pose an additional downstream threat. This analysis had previously been available only to impounding structures constructed prior to July 1982 but would now be available to structures constructed both pre- and post-1982.
107	Michael Schaefer (Virginia Municipal Stormwater Association)	VAMSA supports the opportunity to conduct an incremental damage assessment and reduce the otherwise applicable SDF, when the result of the assessment supports such a reduction. However, Table 1 specifies minimum threshold or floor below which the SDF may not be reduced, even if justified by an incremental damage assessment. The floor applicable to a given dam is arbitrary. Taking that into account along with the loss of the grandfather clause, for existing dams, VAMSA recommends revising Table 1 and section 50 C and section 52 D to allow reductions in the SDF down to the existing spillway design, when justified by the results of an incremental damage assessment.	Table 1, which is contained in section 50, has been further revised from the proposed regulation. This includes the floor for spillway design reduction. Still, a minimal level has been maintained, as engineering models do not always reflect actual flood conditions and thus a margin of safety needs to be maintained.
108	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 52: Incremental Damage Assessment Subsection C establishes the criteria of water depth greater than two feet and flow velocities greater than three feet per second as an "unacceptable additional downstream threat" that precludes a reduction in SDF performance standard by incremental damage assessment. VAMSA members have expressed the concern that these figures are arbitrary and should be more flexible. At a minimum, VAMSA recommends inserting the term "generally" in this subsection ("per second shall generally be used to define conditions"). In addition, VAMSA also suggests providing guidelines on conducting	The criteria contained in the regulations for defining the level of an unacceptable additional downstream threat has been revised to utilize the Rule of Sevens, which is a methodology utilized by many other states that is believed to be an appropriate approach for use in the Commonwealth. Following adoption of these regulations, the Board will develop guidance to provide additional technical details not included in the regulations.

		an incremental analysis. The guidelines should provide criteria for conducting such analyses.	
109	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 54: Dam Break Analysis. For clarity, in subsection D 3, VAMSA recommends deleting the phrase "dam break", because it addresses a "no failure" scenario.	The phrase, "dam break" has been removed from the provision.
110	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 125: Delayed Effective Date for SDF Requirements. In general and in this specific case, VAMSA supports the concept of phasing in new regulatory requirements on a reasonable schedule taking into account all of the facts and circumstances. From an engineering and construction (i.e., not financial) perspective, VAMSA supports the phase-in period specified in subsection A. VAMSA is concerned that the first sentence of subsection A is punitive in that it would deny a needed phase-in period for new requirements if the owner does not hold a "regular" operations certificate. It is unreasonable to "spring" the new requirements, with no phase-in period, on facilities with "conditional" certificates. As to existing deficiencies, VAMSA does not object to subsection D, but VAMSA recommends revising the first sentence of subsection A to read "currently operating under a Regular or Conditional Operation and Maintenance Certificate."	For impounding structures that do not receive a delayed effective date, the Board will continue to utilize the existing conditional certificate process, which emphasizes progress by an impounding structure owner toward coming into compliance with regulatory standards. This process allows the particular situation of each impounding structure to be considered independently and for achievable timelines to be set.
111	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 160: Growth and Removal of Vegetation. Proposed subsection B would require woody vegetation to not be allowed "within a distance of 25 feet from the toe of the embankment and abutments of the dam." VAMSA supports proper maintenance and requirements to keep embankments and emergency spillway areas clear, but is concerned with the proposed "within a distance of 25 feet" requirement, particularly as this requirement would apply to stormwater management facilities in urban areas. The facilities typically require landscaping for either aesthetic or water quality purposes, and the twenty-five foot distance requirement may be a greater distance than necessary in these settings for these facilities. VAMSA recommends that the Board amend this provision by inserting	Section 10.1-609.2 of the Code of Virginia contains the requirements related to the growth of trees and other woody vegetation on impounding structures and also mandates that such vegetation be removed within a distance of 25 feet of the toe and abutments of the impounding structure. The Board does not have regulatory discretion to vary this requirement.

		at the end of subsection B "except for stormwater management or other facilities in developed areas, where landscaping for water quality, aesthetic or other purposes is allowed within this distance so long as facility integrity is not materially adversely impacted."	
112	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 175: Emergency Action Plans. VAMSA fully supports the concept of emergency preparedness, but is very concerned that the proposed frequency of drills (annually) and tabletop exercises (once every three years) will be an excessive burden on dam owners. Although the scope of these activities is not well defined in the proposal, worthwhile drills and tabletop exercises will entail significant preparations in addition to the time involved with the actual drill or exercise. VAMSA questions whether "state emergency management officials" have the time and resources to participate in all of the tabletop exercises with the owners and facilities across the entire Commonwealth once every three years. Based on discussions with VAMSA members, VAMSA recommends a tabletop exercise frequency of once every six years in conjunction with reissuance of the operations and maintenance certificate.	Section 175 has been amended to require that tabletop exercises be conducted once every six years. Additionally, the language of that section has been modified to allow these exercises to be conducted in combination with exercises for other impounding structures when the involved parties would be the same.
113	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 220: Temporary Repairs Prior to Board Approval. VAMSA supports the proposal to allow dam owners to undertake emergency repairs without prior approval of the Board, because the permitting process is impractical and typically too slow to accommodate the needs of an emergency situation. This comment also applies to subsection 60 B.	Section 220 of the regulations allows for emergency repairs to occur without a permit in order to prevent a failure of the impounding structure. This exception is intended to be used in true emergency situations and the owner must notify the Department of emergency repairs performed within 24 hours and obtain the necessary permit as soon as practicable.
114	Michael Schaefer (Virginia Municipal Stormwater Association)	Section 330: Other Applicable Dam Safety References. This section references two FEMA documents and generally refers to "manuals, guidance and criteria used by FEMA." The section is vague as to the binding regulatory effect under this Board regulation of the documents that FEMA uses. VAMSA has no objection to listing references, but does object to incorporating federal documents, especially a broad universe of documents used by FEMA, as a binding state regulation. VAMSA recommends clearly indicating that "the	In addition to the two documents specifically referenced, section 330 does refer generally to manuals, guidance, and criteria used by FEMA as potential sources of information for dam owners and their engineers. The information contained in those documents, however, is not intended to be enforced against dam owners; rather, provisions for which enforcement authority is desired are contained in the regulations themselves, or within documents specifically incorporated by reference. It is not believed necessary in this instance to

		reader is referred to relevant manuals, guidance and criteria used by FEMA as potentially helpful reference sources; however, such manuals, guidance and criteria are nonbinding under this regulation."	add the language suggested by the comment.
115	Michael Schaefer (Virginia Municipal Stormwater Association)	The economic analysis estimates the repair cost range for dams from $145,000 to $10,080,000. Based on VAMSA members' experience, we believe it is likely that the upgrade costs will exceed this range significantly in some cases. The cost figures do not appear to include the cost for administering the engineering and construction. The combined cost estimate of $24,000 for inundation mapping, emergency action plan development, and incremental damage assessment will support only about 300 hours of consultant time, which appears inadequate for most significant and high hazard dams in the experience of VAMSA members.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
116	Michael Schaefer (Virginia Municipal Stormwater Association)	If our understanding is correct, the economic impact could be considerably greater than the $250 million cited in the economic impact analysis. More detailed study of these costs should be done with input from dam owners, and that study should be done in advance of adopting the regulations to the extent that DCR considers cost to be a relevant factor.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically

			recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
117	Michael Schaefer (Virginia Municipal Stormwater Association)	Disproportionate Impact. The background document states that no locality will bear a disproportionate cost. Since each situation will be different, some localities will no doubt be faced with substantial capital costs. VAMSA respectfully submits that the conclusion of no disproportionate impact is inaccurate.	It is clear that the many localities of the Commonwealth own varying numbers of impounding structures, and that each situation will be different. The point addressed by the statement cited by the comment, however, was whether any locality was treated subjectively different; i.e., whether the regulations specify a different requirement for one area of the state versus other areas, or whether a particular regulatory provision is directed toward a situation occurring in a single locality. In the case of these regulations, while the situations of localities will be very different in many cases, that is merely the product of the quantity and condition of their impounding structures, and not due to the singling out of any locality or group of localities.
118	Timothy A. Mitchell (City of Lynchburg)	The Agency Background Document economic analysis cost estimate of $16,417 for inundation mapping would not support more than 200 hours of consultant time. According to a consultant sued by the City for several other projects, the cost of inundation mapping for a nearby dam with similar downstream characteristics was $60,000. Additionally, we have received aerial survey and contour mapping quotations ranging from $61,000 to $98,750, depending on the desired accuracy.	Cost estimates for inundation zone mapping was developed by obtaining estimates from engineering firms that perform work on impounding structures across the Commonwealth. It is believed that the information contained in the economic impact analysis is accurate. It is recognized that mapping and other costs can vary across different types of impounding structures due to factors such as a broad range of sizes, inundation zones, watersheds, and downstream affected properties.
119	Timothy A. Mitchell (City of Lynchburg)	The Agency Background document states that no locality will bear a disproportionate cost per impounding structure. We do not understand how such a broad statement can be made. The background document repair cost range for dams over 50 feet high is estimated at $5,080,000 to $10,080,000. Without further investigation, it is impossible to determine the actual cost for upgrading	It is clear that the many localities of the Commonwealth own varying numbers of impounding structures, and that each situation will be different. The point addressed by the statement cited by the comment, however, was whether any locality was treated subjectively different; i.e., whether the regulations specify a different requirement for one area of the

		Pedlar Dam, but increasing the spillway capacity from 0.23 PMF to 0.75 PMF or PMF as required by the proposed regulations could cost much more than the agency estimate. The agency estimates probably do not account for loss of service of the City's primary source of water during repair, the much higher cost of pumping and chemicals for the alternative raw water source, and administrative costs.	state versus other areas, or whether a particular regulatory provision is directed toward a situation occurring in a single locality. In the case of these regulations, while the situations of localities will be very different in many cases, that is merely the product of the quantity and condition of their impounding structures, and not due to the singling out of any locality or group of localities. The cost estimates are based on the actual costs of repair and upgrade to impounding structures as a result of the regulations and does not contain data related to alternative water sources or other consequential costs.
120	Timothy A. Mitchell (City of Lynchburg)	During a future 6-year O&M recertification, a dam that previously has been permitted to construct a spillway with capacity less than the designated spillway design flood (SDF) for its hazard classification through an incremental damage assessment (IDA) could be required to upgrade its spillway again if the current IDA shows that homes, buildings, roads, or structures built since the last recertification would require an increased spillway capacity.	It is recognized that future development downstream of an impounding structure can affect the required spillway design flood for that impounding structure, including changing the result of the incremental analysis. Determining which standard to upgrade to in the situation that the incremental analysis is employed is the dam owner's responsibility and decision. Should the owner determine to not improve the spillway to the full PMF, there will always be a possibility of a need for future upgrades.
121	Timothy A. Mitchell (City of Lynchburg)	The only protection from this risk would be for the locality where the dam is located to prohibit building in the PMF dam-break inundation zone, which in itself could create land use issues. For many dam owners, where mandatory zoning prohibiting building in the PMF dam-break inundation zone is not feasible, or where the dam is in another jurisdiction, the only reasonable course of action would be to design the spillway for PMF based on "high" hazard classification.	The Board's regulatory authority does not extend to regulation of downstream property owners. The Department is aware of the issue of downstream development affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem. As noted in the comment above, determining which standard to design to is the dam owner's responsibility and decision. Should the owner determine not to improve the spillway to the full PMF, there will always be a possibility of a need for future upgrades.
122	Timothy A. Mitchell (City of Lynchburg)	Measures to prevent future increases in spillway capacity might include: 1) zoning to prohibit building within the PMF dam-break inundation zone, 2) purchase of conservation	The Board's regulatory authority does not extend to regulation of downstream property owners. The Department is aware of the issue of downstream development

		easements within the PMF dam-break inundation zone, or 3) purchase of the affected properties. Purchase of conservation easements would appear the most feasible. Inundation zoning, especially outside the owner's jurisdictions, or property acquisition seem equally not feasible.	affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem, and as a result, House Bill 837 has been introduced during this year's General Assembly session. This bill would create responsibilities for developers of downstream development to contribute to upgrade costs, grant greater planning and zoning responsibilities to localities, and create notification responsibilities related to dam break inundation zones.
123	Timothy A. Mitchell (City of Lynchburg)	According to a summary of state dam safety regulations posted on the DCR website, the proposed regulations appear to be more stringent than most of the states surveyed. Under the proposed regulations, the Pedlar Dam spillway design flood would be ¾ PMF or PMF, depending upon its new hazard classification, but because of the future downstream development issue raised above, more likely PMF. Lost in the development of these regulations is the huge incremental cost between one SDF or another, which can only be determined through engineering analysis, design, and construction yet to be done.	Table 1 has been amended, including the required SDFs. The SDF requirements contained in Table 1 are believed to be in line with the requirements of other states.
124	Timothy A. Mitchell (City of Lynchburg)	The hazard definitions are subjective. We can appreciate that judgment in applying the regulations is desirable, but are apprehensive that the lack of definition might lead to overly conservative or inconsistent rulings.	To assist with clarity in determining hazard potential classifications, definitions for the terms "probable loss of life", "may cause loss of life", and "no expected loss of life" have been added to the regulations.
125	Daniel Osborne (Camp Jacob)	Camp Jacob has owned this dam and has been in existed for 23 years. The dam itself has been there for 40 years. It was constructed in part by the Army Corps of Engineers. Up to this point it has been considered a relatively safe dam. In my opinion we are changing our definition of safe. Just because of that change in definition, it doesn't seem right to me that we would require something that was once safe just because we changed our opinion on what is safe. The dam hasn't changed.	To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures, and that all structures meet what is known to be safe by today's standards.

			In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period. Additionally, the language that was previously contained in section 130 of the regulations has been relocated to section 52, which contains the incremental damage analysis. The incremental damage analysis allows the spillway design requirement of an impounding structure to be reduced where it can be shown that the reduction would not cause an additional threat to public safety.
126	Daniel Osborne (Camp Jacob)	The next comment under the grandfathering had to do with providing complete funding. To me that would be the appropriate action if you are going to impose requirements on existing dams. That should be coordinated with the providing of funds. I hope the Board and all the legislators will consider the fact that there is at least one small dam owner that they can put out of business due to a change in their definition of safe.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
127	Alan Nichols (Windsor Lake Corporation)	You've lumped the fees in such a way and some of the categories that what happens is that the smaller dam owners are getting caught up in ways that are not tolerable for us to be able to manage.	The fees contained in sections 340-400 of the regulations have been amended and reduced from those contained in the initial proposed regulations. It is believed that the fee levels that have been set will be manageable for dam owners.

128	Alan Nichols (Windsor Lake Corporation)	I'd urge you if nothing else to look at a second tier for fees. That tier would be not whether it is high or low hazard, but realistically about the size of the dam itself. I think there needs to be more flexibility size-wise.	The fees contained in sections 340-400 of the regulations have been amended and reduced from those contained in the initial proposed regulations. It is believed that the fee levels that have been set will be manageable for dam owners. Fees were established based on the workload associated with different categories of dams. It is the Department's experience that this workload varies by hazard classification and not by the size of the dam; therefore, the fees continue to be set based on hazard classification.
129	Connie Bennett (York County)	It was brought to my attention that the classifications were broken out so that the first order was what was downstream of the system. In other words if it was a dam that had a secondary or primary road or major facility downstream from it that put it in a classification regardless of the size of the dam or the height of the dam. I think it needs to clarify in the definition at least for the 6 ft. height dam that regardless of the storage capacity if the intent is that the secondary roadway or major utility downstream that would also come under the requirement of needing a permit.	With some exceptions, impounding structures that are 25 feet and greater in height and that create a maximum impoundment capacity of 15 acre feet or greater and those that are 6 feet or greater in height and that create a maximum impoundment capacity of 50 acre feet or greater are regulated and would require a permit. These size requirements are specified by the Dam Safety Act (§10.1-604 et seq. of the Code of Virginia) and included in section 30 of the regulations, in the definition of what constitutes an "impounding structure" for the purposes of the regulations.
130	Connie Bennett (York County)	The other question that was brought up at a meeting that we had was the impact of the changes in spillway height could be impacting upstream owners especially in the Tidewater Area. If you have to raise the height of the dam it puts more people around the body of water in the flood area. It may be impacting more people upstream than down stream.	The Board's authority under the Dam Safety Act (§10.1-604 et seq. of the Code of Virginia) is limited to ensuring the safe design, construction, operation and maintenance of Virginia's impounding structures. Limitations on the area occupied by an impoundment are outside of the Board's authority and are subject to other laws and regulations, as well as general property law principals.
131	Scott Cahill (Watershed Services, Inc.)	4VAC50-20-80. I'm still very concerned about the concept of requiring an alteration permit for items, which are considered maintenance even in the verbiage. I think that a dam owner should be free to continue to do items of maintenance on his dam without any incumbent cost or inconvenience whatever.	Language has been added to section 30 and section 80 to specifically state that "structural maintenance" (for which a permit is required) does not include routine maintenance. This would effectively clarify that no permit is required for routine maintenance. Overall, the term "alteration" is defined in section 10.1-604 of the Code of Virginia and the Board does not have the authority to vary that definition. As observed by the new language, however, the definition is limited to repairs or

			maintenance related to the structural integrity of the impounding structure, and is not intended to extend to repairs and maintenance not related to the impounding structure's structural integrity. Section 80 of the regulations additionally provides examples of activities that do require alteration permits.
132	Scott Cahill (Watershed Services, Inc.)	On 4VAC-50-20-105, Subsection e-1, I would like to recommend that we incorporate into here a statement requiring the engineers to have some inspections done on the conduits and structures of the dams. We see a whole lot of failures due to parallel porting and failures of conduits.	While inspections of conduits are recommended, it is believed that there are a limited number of engineering firms available to conduct such inspections and that the costs of these inspections would be overly burdensome to require of every dam owner. The dam owner's engineer should, however, recommend such inspections where believed necessary.
133	Scott Cahill (Watershed Services, Inc.)	4VAC50-20-390. The cost of the permits both under the conditional and under the regular, I would implore you that you consider the cost of these permits and mitigate the cost to the dam owners doing the right things and increase the costs to the dam owners not doing the right things.	The costs of permits set forth in sections 340-400 of the regulations have been amended and reduced. It is believed that the costs associated with regular operation and maintenance certificates will be manageable for dam owners, while fees for conditional operation and maintenance certificates will be higher.
134	Lisa Cahill (Watershed Services, Inc.)	One of my issues with the regulations is the infamous Table 1. Line 213 is where that starts. It contains sizes of dams. Since the issue here is basically public safety and to protect human life, the size of the dam that would injure or kill someone is really irrelevant and has no place in Table 1.	Table 1 has been revised and no longer distinguishes among impounding structures based on their size.
135	Lisa Cahill (Watershed Services, Inc.)	I also agree that an operation permit should not be needed for maintenance. It discourages proper action. It's too easy at that point to say I just won't replace the seal instead. Their time is restricted, their efforts are restricted and the path should be paved for them as much as possible to do the right thing.	Language has been added to section 30 and section 80 to specifically state that "structural maintenance" (for which a permit is required) does not include routine maintenance. This would effectively clarify that no permit is required for routine maintenance. Overall, the term "alteration" is defined in section 10.1-604 of the Code of Virginia and the Board does not have the authority to vary that definition. As observed by the new language, however, the definition is limited to repairs or maintenance related to the structural integrity of the impounding structure, and is not intended to extend to repairs and maintenance not related to the impounding structure's structural integrity. Section 80 of the regulations additionally provides

			examples of activities that do require alteration permits.
136	Lisa Cahill (Watershed Services, Inc.)	Line 1587 and following, which is Section 50-20-280, drain requirements. I would proposed that the word "new" be struck so that it reads all impounding structures, regardless of their hazard conditions, classification shall include a device to permit draining of the impoundment within a reasonable time as instructed by the owner's licensed professional engineer. I would hate for existing dams to begin to think they could do away with drainage structure.	Language has been added to section 280 to require that existing drains be kept operational, and that drains be added to existing impounding structures when practicable.
137	Lisa Cahill (Watershed Services, Inc.)	Section 50-20-280. Also I would strike the last few words, "subject to the approval by the Director."	The language, "subject to the approval by the Director," has been removed.
138	Barlow Delk (Louisa County Water Authority)	One of the things pointed out is possibly that the spillways are not wide enough. The requirements were changed on the spillway. One of our points is that we didn't want to comply with proposed regulations. You're in the process of writing those regulations. If we comply with proposed regulations what's there to say after we've spent the money and we come back and a few things are different in the regulations.	The requirements contained in the proposed regulations are not applicable until the effective date of the regulations. Until that time, the previous regulations remain applicable.
139	Barlow Delk (Louisa County Water Authority)	The regulations are asking for a dam break analysis using a probable maximum flood without a dam failure. What is a dam break analysis if the dam didn't fail? That sounds like a probable maximum flood analysis, but you are asking us or somebody down the road to do something that is completely illogical.	Section 54(D)(3) has been amended to remove the reference to a "dam break analysis without a dam failure." The intent of that provision is to demonstrate a flooding event without a dam failure for comparison with a demonstration of a flooding event with a dam failure. This will show the impact of the dam failure in addition to the flooding condition.
140	Barlow Delk (Louisa County Water Authority)	Somehow these regulations claim that 100 acre-feet of water in an agricultural pond that's say, 24.5 feet tall, is of no hazard downstream. It doesn't even ask anything, it just asks the owner to say it's an agricultural pond. There is no analysis downstream.	The exemption for agricultural dams is contained in the Code of Virginia (specifically in the definition of "impounding structure" contained in §10.1-604) and the regulations merely reflect this exemption. The Board does not have the authority to alter or remove the agricultural exemption, which would require an act of the General Assembly.
141	Barlow Delk (Louisa County Water Authority)	PMF to me has a special meaning. When I have the data sent to me saying 28 inches of rain in six hours, I would define that as August 19-20, 1969, Lovingston, Virginia in Nelson County. I was out in that probable maximum flood. Many miles of highway will be washed	It is recognized that a PMF event is a flood of extreme magnitudue. As recognized by the comment, data shows that PMF events can and do occur in Virginia. The Board is charged by the Dam Safety

		away by the probable maximum flood. I saw five tractor-trailer trucks parked on the side of Route 29 washed away by a probable maximum flood. In months of looking, we never found a single trace of those trucks anywhere. One tractor-trailer was found buried in sand in a place called Nelson Wayside. You are talking about asking us to design and maintain dams that will handle this water. I think you are fooling yourselves and the people of Virginia if you think that you are going to save anyone or do anything in a probable maximum flood. I almost think PMF trivializes what we are talking about.	Act, §10.1-604 et seq. of the Code of Virginia, to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. The Board must be guided by this mandate in adopting regulations. As Virginia does experience events approaching and including the PMF, it is appropriate to ensure that higher hazard dams are prepared to sustain such a flood.
142	Barlow Delk (Louisa County Water Authority)	We're asked to build new dams and retrofit dams to do this. After 9/11 did anyone say we should go through New York City and retrofit every building? When a tornado comes through Kansas they don't say that we will build back to withstand a probable maximum tornado.	It is understood that other types of infrastructure are not required to upgrade each time that standards are changed. In the case of impounding structures, however, public safety, which is the sole concern of the regulations, is directly impacted by the standards in place. To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures.
143	Barlow Delk (Louisa County Water Authority)	I work with water and sewer business in Louisa County. I'm on the side of I-64 all the time. I look at a seven ft. by six ft. culvert. Every one of those at a probable maximum flood is a dam. I don't think any of them would take 28 inches of water in six hours. Under the Southern Railroad in the county there is a tunnel under it about 20 feet wide about 25ft high. That tunnel under the Southern Railroad will back water up 50 ft. deep on a 60ft field for over a mile. That's a probable maximum flood in reality.	The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq.) is to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. While other types of infrastructure may be designed to criteria different than that required for impounding structures, the Board must set forth the requirements that it believes are necessary to carry out its mandate pursuant to the law.
144	Lisa Cahill (Watershed Services, Inc.)	Line 114 references the crest of the lowest un-gated outlet. As I was first reading the regs., seeing the word "crest" made me think of the spillway, like the emergency spillway,	The term referred to by the comment, "normal impounding capacity", has been removed from the regulations and a new term, "normal or typical water surface

		which would be appropriate. But as I read further, I felt that could be construed to be the top of the riser or structure, which would cause that reference to be normal pool height which would probably not be appropriate. That term is not specifically defined in the definitions section and I think a definition would be very helpful.	elevation," has been added. The new definition does retain the reference to "lowest ungated outlet," but does provide for other levels to be considered in the instances of flood control or stormwater detention structures, or if the level at the lowest ungated outlet is not typical.
145	Lisa Cahill (Watershed Services, Inc.)	Some other definitions seem to be needed. Line 160 "serious economic damage", Line 166 "appreciable economic damage," and Line 174 "minimal economic damage." I'm not sure the right way to do that. I'm sure that dollar values might not be appropriate. But some guidance needs to be there because what you might consider minimal economic damage I might consider major economic damage.	Due to difficulties in establishing dollar value thresholds statewide, and in order to allow engineering judgment to factor in to determinations of hazard classification, terms related to levels of economic damage have been left flexible. This does not foreclose the possibility of guidance being issued in the future.
146	Lisa Cahill (Watershed Services, Inc.)	Some other definitions seem to be needed. Same thing for primary and secondary utility. I'm not absolutely certain what a secondary utility is unless we're talking size of people serviced by a particular utility. And if that's the case, then define it that way.	It is believed that impacts to utilities are more a question of degree of impact than of type of facility. Therefore, the terms "primary" and "secondary" have been removed from the regulations. The requirement for consideration of impacts to "utilities" remains.
147	Lisa Cahill (Watershed Services, Inc.)	The roads also seem to need some definition to me. Major public roads, public roads and secondary public roads are what are listed in the high significant and low hazard classification. I think in this case the use of VDOT definitions for those roads would be appropriate. I know that they have maps for each county where they specifically say which roads are secondary, which roads are primary.	Definitions for the terms "major roadways" and "secondary roadways" have been added to section 40 in order to increase specificity.
148	Dan Rublee (City of Harrisonburg)	In regard to the inundation zone mapping, can there be some kind of legislation that forces or requires the jurisdictions in the inundation zones to be cooperative with dam owners in regard to determining land owners, property owners, planned land use and things like that. I fear particularly for private landowners who may be trying to get information from the local government.	The Board's regulatory authority does not extend to regulation of downstream property owners. The Department is aware of the issue of downstream development affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem, and as a result, House Bill 837 has been introduced during this year's General Assembly session. This bill would create responsibilities for developers of downstream development to contribute to upgrade costs, grant greater planning and zoning responsibilities to localities, and create notification

			responsibilities related to dam break inundation zones.
149	Dan Rublee (City of Harrisonburg)	On Line 184, this discusses the present and planned land use in the dam break inundation zone to be used for determining classifications. Planned land use is a very undefined term. That could mean anything something that needs to be constructed to something that's in a long-range construction plan that might change at some point in the future. I think there needs to be some kind of clarification as to what planned land use would mean.	To increase clarity, a definition of "planned land use" has been added to the definitions section (section 30) of the regulations. The current definition is "…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."
150	Dan Rublee (City of Harrisonburg)	Line 239 talks about the PMF hydrographs used for looking at the analyses. It says that the hydrograph that creates the largest peak outflow is to be used. I guess I'm confused as to whether that is the largest peak flow from the hydrograph or is that actually the largest peak outflow after you've routed the hydrograph through the dam facility.	The language cited by the comment is intended to be interpreted as the largest peak outflow after the hydrograph is routed through a dam facility.
151	Dan Rublee (City of Harrisonburg)	Line 285 discusses in the incremental damage analysis water depths greater than two feet and over bank flow velocities greater than three feet per second shall be used to define conditions for unacceptable additional downstream threat. This is a question to clarify whether or not that is an additional two feet and additional three feet per second or is that those numbers in general. That could be better defined.	The language cited by the comment has been revised to specify that "an additional downstream threat to persons or property is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than seven."
152	Dan Rublee (City of Harrisonburg)	Under Section 54, Dam Break inundation zone mapping, this discusses that when determining hazard potential classifications, a minimum of the following shall be provided and it talks about the different analyses that need to be done. Items two and three say a dam break analysis using a PMF with a failure and a dam break analysis using a PMF without a dam failure. I understand that a dam break analysis doesn't necessarily infer that the dam actually breaks. Could you just put analysis there as opposed to dam break analysis? There is confusion as to how you can have a dam break analysis without a dam failure.	Section 54(D)(3) has been amended to require an "analysis", rather than a "dam break analysis", in order to aid clarity.
153	Dan Rublee (City of Harrisonburg)	In the inundation map section, Paragraph "e" under EAP requirements, it says you are required to keep a list of downstream inundation zone property owners and occupants. I don't think that any jurisdiction	Section 175 has been amended to clarify that systems such as reverse 911 may be utilized. The dam owner is responsible for developing a notification chart demonstrating how parties affected by a

		can actually keep up with the occupants of specific structures. In the case of the dam that the City of Harrisonburg owns, a lot of the downstream property is renter occupied and not owner occupied. It becomes quite a task to track down specific occupants. In our jurisdiction we have implemented our EAP through a reverse 911 calling system. That's been acceptable to the reviewers as far as our permitting goes. I wonder if there can be some kind of language in that section that allows for alternatives to the specific listings of owners and occupants and things like that where technology can be better utilized.	dam failure will be notified; use of reverse 911 is just one method that may be utilized by a local emergency services department to achieve notification of downstream residents, if that responsibility is assigned to the emergency services department.
154	Dan Rublee (City of Harrisonburg)	In Section 175, under the emergency action plan requirements it discusses the drills and exercises required in the EAP. I'd like to comment that, at least for the tabletop exercise, you're talking about pulling together quite a number of people who are very busy. I'd like to submit that rather than have that on a 2-year or 3-year basis that it would be done on the same cycle with the re-permitting phase. So it would be done on a six-year cycle as opposed to a three-year cycle, bringing state, local and possibly federal emergency personnel together.	Section 175 has been amended to require that tabletop exercises be conducted once every six years. Additionally, the language of that section has been modified to allow these exercises to be conducted in combination with exercises for other impounding structures when the involved parties would be the same.
155	Charles de Seve (Lake Barcroft Watershed Improvement District)	Your study group thus far has recommended an extreme scenario as the basis for new dam regulations. It envisions a storm of such devastating effect as to render the area for which we are concerned a catastrophe of Hurricane Katrina proportions. It would seem to the LBWID that the State has made up its mind on an unreasonable criterion and will consider nothing else. It is easy to set the most stringent standard to avoid applying judgment as opposed to considering what is reasonable and justifiable. To arbitrarily define the standard for dam safety without a thorough analysis of the effects is not in the best interests of the State, the Division of Conservation and Recreation and the Board itself.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942).
156	Charles de Seve (Lake Barcroft Watershed Improvement District)	As they stand, the proposed regulations translate into a huge expense for both local government and private dam owners without even a vague assessment of the added safety that dam modifications would confer. There are alternatives to consider, particularly in creating, funding and implementing serious	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations.

		and well designed emergency action plans, addressed in the regulations but not the central focus it should be. Local government and private dam owners have a finite amount of money available, and the Board has not shown evidence that its regulations will make wise use of funds or enhance public safety to a significant degree.	The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
157	Charles de Seve (Lake Barcroft Watershed Improvement District)	The proposed regulations are based on the wrong assumption that requiring dams such as Lake Barcroft's to withstand a one PMF storm event will significantly reduce the risk to lives and property downstream.	It is recognized that a PMF event is a flood of extreme magnitude. As recognized by the comment, data shows that PMF events can and do occur in Virginia. The Board is charged by the Dam Safety Act, §10.1-604 et seq. of the Code of Virginia, to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. The Board must be guided by this mandate in adopting regulations. As Virginia does experience events approaching and including the PMF, it is appropriate to ensure that higher hazard dams are prepared to sustain such a flood.
158	Charles de Seve (Lake Barcroft Watershed Improvement District)	The Board's discussions of inundation tend to create the impression that the danger to life and property is mainly the result of spillway or dam failure. In the case of Lake Barcroft, engineering studies show conclusively that the greatest risk to life and property downstream is the flooding that would occur during any PMP/PMF with no dam failure.	It is recognized that flood situations other than dam failure can have impacts to life and property. The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq. of the Code of Virginia), however, is to ensure the safe design, construction, operation, and maintenance of the Commonwealth's impounding structures. The proposed regulations, as revised,

			attempt to fulfill that mandate.
159	Charles de Seve (Lake Barcroft Watershed Improvement District)	The severe and unbending nature of the regulations appear to be a substitute for the more complex tasks of gathering and analyzing data, measuring degrees of risk and calculating the incremental benefits and costs of new regulations. It is as if the decision was to pick the maximum storm event, require dams to withstand it, and simply assume lives and property were made safer. This may actually put more lives at risk.	Section 50 of the regulations, which includes Table 1 (containing spillway design flood requirements) has been revised significantly from the proposed regulations. Still, it does require PMF standards for high hazard dams. The new regulations do contain, however, an opportunity for a site-specific incremental analysis to be conducted (section 52). This analysis will allow the spillway design flood requirement to be tailored to an individual dam where it can be demonstrated that a reduction in the required design flood will not increase threats to life or property.
160	Charles de Seve (Lake Barcroft Watershed Improvement District)	No one, not the Board, not DCR, not the Virginia Department of Planning and Budget (which did an admittedly incomplete economic impact analysis), nor the local government, has a useful census of dams and their situations throughout Virginia. No one has amassed complete data on the likely areas of flooding and of inundation, the persons and properties at risk of flooding and inundation, the likelihood of existing impoundment structures to fail at different storm levels, and the reduced level of risk and higher cost that implementing these proposed regulations might bring.	Since the number of regulated dams in the Commonwealth was greatly expanded due to a 2002 change to the Code of Virginia, the Department has been actively working to compile and analyze a complete dam inventory for the state. The Department continues to seek funding for dam safety engineer positions to assist with this task.
161	Charles de Seve (Lake Barcroft Watershed Improvement District)	For low freeboard dams like Lake Barcroft, the regulations will do little to improve safety. For high freeboard stormwater retention dams there is the greater potential for the regulations to reduce risk. The proposed regulations make no proper distinction among dams and their unique situations.	Engineering analyses are site specific (section 20) and will consider each dam independently. The criteria contained in the regulations were developed based on what is believed necessary to be protective of public safety.
162	Charles de Seve (Lake Barcroft Watershed Improvement District)	Elimination of subjectivity in the proposed regulations is presented by the Board as a positive accomplishment. In fact, it eliminates or reduces essential engineering judgment that would take into account unique conditions for specific dams.	The regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "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." It is expected that engineering judgment will still be applicable to areas including, but not

			necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
163	Charles de Seve (Lake Barcroft Watershed Improvement District)	The proposed regulations are overly restrictive in that certain dams are required to withstand a universal standard (one PMF) without respect to their downstream hydrology and the pattern of downstream development. If it is the intention of the Board to allow these factors to be taken into account when evaluating the need to redesign dam structures, then the regulations should provide more guidance or at least the flexibility for engineering judgment to intervene.	As noted in the previous comment, the regulations continue to recognize that engineering judgment is necessary and will be factor in determinations to be made. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat.
164	Charles de Seve (Lake Barcroft Watershed Improvement District)	It is doubly inappropriate to simultaneously add more restrictive regulations pertaining to spillways when their consequences are largely unknown and to also remove the flexibility to take particular circumstances into account as facts and consequences emerge.	Table 1 of section 50, which contains the spillway design flood requirements for impounding structures, has been significantly revised from the proposed regulation and it is believed that the revisions will provide more flexibility for dam owners. Additionally, section 52 of the regulations provides for an incremental analysis, which would allow for a reduction to the required spillway design flood where it can be shown that such a reduction will not increase threats to lives or property.
165	Charles de Seve (Lake Barcroft Watershed Improvement District)	In support of the proposed regulations there is only the most rudimentary and casual estimate of the cost to local government and private dam owners to comply. Yet knowing the cost is essential to making decisions about where to apply scarce funds to protect the most lives. The cost of these regulation are huge and would severely reduce money available for more essential lifesaving and risk-averting programs.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, “The Cost of Rehabilitating our Nation’s Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003”. It was specifically recognized in the “significant qualifiers” portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time.

			Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
166	Charles de Seve (Lake Barcroft Watershed Improvement District)	The statewide cost, officially estimated at $249 million, well under $1.5 million per dam (for the 166 dams officially assumed to need alteration), is low when compared to a $20 million estimate for Lake Barcroft's dam alone. Even the inundation mapping cost of $16,417 is well below Lake Barcroft's cost of approximately $60,000.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
167	Charles de Seve (Lake Barcroft Watershed Improvement District)	To pay for the estimated $20,000,000 cost of design and rebuilding required to meet the new standard, the Lake Barcroft Water Improvement District would have to sell 30 year bonds requiring an annual payment of $1,400 per family in the district. This would mean a three-fold increase in the property tax that LBWID imposes going from $700 per family per year to $2,100.	It is recognized that upgrades and repairs to dams are often very expensive. The Board's regulations (or the Dam Safety program), however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams.

			The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
168	Charles de Seve (Lake Barcroft Watershed Improvement District)	Greater emphasis on implementing emergency action plans and other approaches would save more lives and property than the new spillway requirement, certainly in the case of Lake Barcroft and in similar situations through Virginia.	It is recognized that emergency action plans have an important role to play in protecting lives and property in emergency situations at impounding structures. To that end, the regulations contain significant improvements to specifications regarding emergency action plans. Non-structural mechanisms, however, cannot be relied upon alone to protect lives and property. It is important that dam structures be designed, constructed, maintained, and operated in a way that is protective of public safety.
169	Charles de Seve (Lake Barcroft Watershed Improvement District)	The safety of lives and property would be better served by sound and well-funded emergency action plans to secure property and remove persons from flood areas, than by re-engineering certain dams. While the proposed regulations speak to EAPs, there is no guidance or standards of action or accompanying recommendations to fund the required effort.	It is recognized that emergency action plans have an important role to play in protecting lives and property in emergency situations at impounding structures. To that end, the regulations contain significant improvements to specifications regarding emergency action plans. Non-structural mechanisms, however, cannot be relied upon alone to protect lives and property. It is important that dam structures be designed, constructed, maintained, and operated in a way that is protective of public safety.
170	Charles de Seve (Lake Barcroft Watershed Improvement District)	Effective EAPs will require far more public funding for personnel, training and equipment to conduct inspections, monitor storms, evacuate persons and secure property than currently budgeted. However, this approach will offer significantly greater risk reduction and higher public safety levels than spending scarce funds to make dams withstand a one PMF storm event. EAPs are the real path to reducing risk from storms.	As noted above, it is recognized that emergency action plans have an important role to play in protecting lives and property in emergency situations at impounding structures. To that end, the regulations contain significant improvements to specifications regarding emergency action plans.
171	Charles de Seve (Lake Barcroft Watershed Improvement District)	Implementing dams to withstand a one PMF storm event gives a false sense of security because such a storm is highly unlikely compared to far lesser storms that will certainly put lives at risk and cause massive property damage.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the

			point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942).
172	Charles de Seve (Lake Barcroft Watershed Improvement District)	Spending massive amounts to make dams fail-safe in the improbable event of a one PMF storm will reduce funds available to protect lives and property during the 100 year storms and less that are far more likely to occur and will surely produce severe flooding and risk to lives and property. Other things equal, scarce funding is better spent where it can more effectively reduce eminent risks than rare ones.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942).
173	Charles de Seve (Lake Barcroft Watershed Improvement District)	The one PMF standard for dams is inconsistent with the actual zoning and development of real estate within the flood plain and inundation area. The flood plain of a one PMF event is much more extensive and will embrace many more families and property than that of the 100-year storm usually envisioned in flood insurance limits and for zoning restrictions on development.	It should be noted that the FEMA 100 year floodplain is not the same as the 100 year storm standard. While the PMF flood event will be greater than the 100 year flood event, the criteria contained in the regulations are based on what is believed necessary for the safe design, construction, operation and maintenance of dams.
174	Charles de Seve (Lake Barcroft Watershed Improvement District)	The so called economic impact statement and cost-benefit analysis conducted by the Virginia Department of Planning and Budget is woefully inadequate. It cannot possibly guide the Board on the cost of the proposed regulations, the economic and social benefits relative to cost, the impact on taxpayers, on units of government, on private owners and on the economy of Virginia.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these

			costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
175	Charles de Seve (Lake Barcroft Watershed Improvement District)	The economic analysis should consider the relationship between cost and risk. It is not evident either in the regulations or in the economic report that the trade-off between safety and cost is understood. All systems are subject to failure and typically the cost to reduce risk increases more than proportionately as the level of risk reduction rises. It is hard to imagine any systems (bridges, highways, aircraft, nuclear reactors, etc.) designed to withstand the conditions at the very end of the applicable probability curve. The wording of "Probable Maximum Precipitation" and "Probable Maximum Flood" suggest the regulations are trying to push into extreme definitions of risk, which will prove to be highly expensive yet ineffective in reducing risk significantly.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
176	Charles de Seve (Lake Barcroft Watershed Improvement District)	Under the proposed regulations, there is no provision to grandfather dams constructed earlier than 1982, a practice under current regulations. There is a real difference between old and new dams with older dams incurring far higher costs to comply via retrofitting despite having a satisfactory record of safety, inspections and maintenance.	To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing

			structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period. Additionally, the language that was previously contained in section 130 of the regulations has been relocated to section 52, which contains the incremental damage analysis. This new section would allow the old section 130 process to be applied to all dams, including those constructed prior to 1982.
177	Charles de Seve (Lake Barcroft Watershed Improvement District)	There should be a strong recommendation accompanying the proposed regulations that the Commonwealth provide funds for local governments and private owners to reconstruct their dams. Both the enormous cost of rebuilding dams and the fact that permitted downstream and upstream development created much of the risk suggests the expense of retrofitting be a cost of society born by all through statewide taxes.	Financial needs of dam owners are recognized. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round will be conducted between December 1, 2007 and February 1, 2008.
178	Charles de Seve (Lake Barcroft Watershed Improvement District)	There is concern that a number of existing dams do not meet current standards. Funds are better spent on inspections and stronger more effective enforcement in these instances. More stringent regulations will not remedy deficiencies if current less severe ones do not.	The Board is charged by the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, to adopt regulations that ensure the safe design, construction, operation and maintenance of Virginia's impounding structures. In conducting this revision to the regulations, which were last reviewed comprehensively in 1989, the Board must be guided by its mandate. While it is recognized that many impounding structures still need additional work to become compliant with current requirements, waiting to adopt proper standards will do little more than cause these structures to undergo two upgrades instead of one (one in order to meet current standards, and then

			another to meet revised standards at a later date should the standard be increased). This would increase the overall burden to impounding structure owners. To assist impounding structure owners with compliance, the Department continues to seek additional staffing in order to provide additional outreach and guidance. The Department also continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008
179	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: continue with the regulatory process, but withhold final regulations until valid cost-benefit measures can be calculated to ensure that public and private investment is made in ways that truly reduces risk to life and property.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round

			is being conducted between December 1, 2007 and February 1, 2008.
180	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: mandate inundation mapping for all significant dams. For both one-half PMF and one PMF, maps would show the area of general flooding and the area of inundation following dam failure for each impoundment. Maps would also include a count of persons and property within the areas affected.	Mapping of all structures is required for hazard classification purposes except for certain low-hazard dams. Sunny day, probable maximum flood, and spillway design flood failure scenarios are required, as well as spillway design flood without a failure. Maps are required to identify downstream structures and residents.
181	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: commission studies to: (a) Calculate the degree of risk reduction (counts of persons and property) moving from the current standards to the proposed regulations using the required inundation maps. (b) Evaluate alternative strategies to protect lives and property--to what extent could well constructed Emergency Action Plans (EAP) save lives and property during general flooding and with inundation from a dam failure. Estimate their cost. (c) Calculate realistic estimates of the cost of reengineering and implementation of the alterations for each dam to comply with the proposed regulations. (d) Calculate the incremental benefit of the proposed regulations compared to the cost. This would be a true cost-benefit analysis that takes account of the joint probabilities of flooding and inundation and the lives and property at risk. (There are standard models and tools for this.)	The regulations are the result of the work of a technical advisory committee process that extended over a six-month period and included dam owners, consultants, localities, state and federal representatives, and others. Much discussion and analysis was completed during this process and during the process following the TAC that resulted in the economic impact analysis for the proposed regulations, as well as during the public comment period on the proposed regulations. It is believed that the final product of this work is a set of regulations that effectively promote the safe design, construction, operation, and maintenance of Virginia's dams, while being cognizant of dam owner concerns and circumstances.
182	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: request that the Commonwealth provide additional regional engineers and augment dam safety by enforcing compliance with existing regulations, particularly for those dams already known to be deficient. As noted above, higher standards will not single-handedly ensure compliance by owners of deficient dams under current regulations.	The Department continues to seek additional funding and positions for dam safety engineers. The Board is charged by the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, to adopt regulations that ensure the safe design, construction, operation and maintenance of Virginia's impounding structures. In conducting this revision to the regulations, which were last reviewed comprehensively in 1989, the Board must be guided by its public safety mandate, and the regulations developed through this action seek to accomplish that end.
183	Charles de Seve (Lake Barcroft Watershed	We recommend to the Board the following: make a distinction between existing and new dams, both in terms of the flexibility of applying the regulations and in	To "grandfather" existing structures would ignore the reality that public safety is not dependent upon the age of an impounding structure, but rather on its design and

	Improvement District)	recommending financial support of reengineering and alterations for existing dams (particularly in cases where the apparent risk from inundation has been increased by the pattern of zoning and development within the inundation area).	condition. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. In order to allow for impounding structures that are in compliance with the Board's regulations to have time necessary to upgrade to the new standards contained in these regulations related to spillway design flood, section 125 does contain a delayed effective date provision that would permit these upgrades to be phased in over an 8 to 11 year period. Additionally, the language that was previously contained in section 130 of the regulations has been relocated to section 52, which contains the incremental damage analysis. This new section would allow the old section 130 process to be applied to all dams, including those constructed prior to 1982.
184	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: Recommend public funding for private dams where the need for spillway modifications arises because of downstream and upstream development approved and abetted by local governments.	The Board's regulatory authority does not extend to regulation of downstream property owners. However, the Department is aware of the issue of downstream development affecting the hazard classification and associated spillway design requirements of dams. To that end, the Department has been recently working with numerous stakeholders on possible legislative solutions to this problem, and as a result, House Bill 837 has been introduced during this year's General Assembly. This bill would create responsibilities for developers of downstream development to contribute to upgrade costs, grant greater planning and zoning responsibilities to localities, and create notification responsibilities related to dam break inundation zones.
185	Charles de Seve (Lake Barcroft	We recommend to the Board the following: develop a process to maintain an accurate and detailed account of all currently regulated	The Department does maintain a database of dam owners. This database is continually updated and the Department is working to

	Watershed Improvement District)	dams and dams that should be regulated to ensure that dam owners are aware of the pending regulations.	expand the database based on additional structures brought under regulation by changes in the Code of Virginia.
186	Charles de Seve (Lake Barcroft Watershed Improvement District)	We recommend to the Board the following: enlarge the focus of the analysis to flooding in general and compare the risk of flooding with the risk of inundation for each regulated dam. Dam safety should be considered in the larger context of flooding and overall risks to persons and property.	Incremental damage analysis is being made available to every dam owner by new section 52 of the regulations and considers flooding risks independent of the failure of a dam in comparison to risks created by the failure of a dam.
187	Charles de Seve (Lake Barcroft Watershed Improvement District)	A one PMF storm event would require Lake Barcroft's dam to withstand 59,000 cubic feet per second of water flowing not only over the primary and secondary spillways, but also over the breadth of the entire dam structure. This would require redesign and reconstruction of the earthen embankment between the central masonry portion of the dam and the western shore and other modifications to dam structure, at a cost of approximately $20 million.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. Additionally, whether a dam must be upgraded to the required spillway design flood may be dependant on the results of an incremental damage analysis. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
188	J. Eldon Rucker (Lake of the Woods Association, Inc.)	The proposed regulations involve a major philosophical issue. We believe the DCR/SWCB is pushing for a regulation that requires compliance with rigid standards (Table 1) with little room for cost consideration, engineering judgment, consideration of local conditions or common sense.	Engineering judgment remains an important consideration under the regulations and is specifically provided for in section 20. The regulations additionally contain flexibility in many areas, including the provision for an incremental analysis to be conducted by all dams. Additionally, the requirements contained in

			the regulations relating to spillway design flood standards have been amended. These amendments appropriately reduce standards for many dams from what the proposed regulations would have required.
189	J. Eldon Rucker (Lake of the Woods Association, Inc.)	Further, there is no provision for fiscally responsible cost benefit analysis and no defined process that an owner can follow in an attempt to demonstrate to DCR/SWCB that a dam does not pose an unreasonable hazard to life and property.	The regulations do permit the spillway design requirement for a dam to be reduced in cases where it can be shown that failure of the dam would not pose an additional downstream threat. This incremental analysis is contained in section 52. It is believed that this provision will allow reductions in spillway design requirements where engineering data can show that the reductions do not come at the cost of public safety.
190	J. Eldon Rucker (Lake of the Woods Association, Inc.)	It appears that the assumption is that if one human lives or works in the inundation zone, there will be probable loss of life and the dam is therefore a high hazard dam, whatever its size. This mind set will result in modification of almost every dam built before 1985, and many that were built after. I believe, as a matter of good public policy, the regulations should be targeting dams that clearly pose an unreasonable hazard to life and property and the regulations should provide a methodology for determining what is reasonable and unreasonable.	The technical advisory committee (TAC) that assisted with the development of the regulations considered the subject of whether or not one human life should be sufficient to cause a change in hazard classification. After discussion, it was determined that any loss of human life was unacceptable and that the regulations should take all actions necessary to ensure safety. The regulations do permit the spillway design requirement for a dam to be reduced in cases where it can be shown that failure of the dam would not pose an additional downstream threat. This incremental analysis is contained in section 52. It is believed that this provision will allow reductions in spillway design requirements where engineering data can show that the reductions do not come at the cost of public safety. The technical advisory committee that assisted with the development of the regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures.
191	J. Eldon Rucker	Specifically, the regulations should continue to recognize that existing dams built before	The technical advisory committee (TAC) that assisted with the development of the

	(Lake of the Woods Association, Inc.)	the enactment of the Dam Safety Act, may not satisfy current criteria, but should not be required to undergo costly and disruptive modifications to meet newly established standards unless it is clearly shown that without those modifications, they constitute an unreasonable hazard to life and property. In determining what constitutes an unreasonable hazard to life and property, I believe the regulations should provide specific criteria the Board should use in making the determination. Those criteria might include: (1) The structure is performing in accordance with its design and purpose (2) Operation and maintenance is satisfactory –(3) The approved EAP clearly demonstrates the capability for timely notification and evacuation of anyone in the inundation zone. (4) Plans exist to control development and/or minimize damage in the inundation zone. (5) A cost benefit analysis has been performed weighing the benefits of an increase in the SDF against the costs of modifying the spillway to accommodate a higher discharge (6) The owner satisfies all special requirements imposed by the Board	regulations considered the issue of setting different standards for old and new impounding structures, including grandfathering of existing structures. Following this discussion, it was determined that public safety interests mandated the equal treatment of all impounding structures. The TAC also considered "Alternative 2", which was an alternative matrix for the required spillway design flood for dams. A subcommittee of the TAC met to discuss this concept specifically. After that subcommittee meeting, and a discussion of the full TAC, it was agreed that allowing considerations not related to the design and operation of the dam to influence the required spillway design standard would not be protective of public safety. Rather than "Alternative 2," the regulations permit the spillway design requirement for a dam to be reduced in cases where it can be shown that failure of the dam would not pose an additional downstream threat. This incremental analysis is contained in section 52. It is believed that this provision will allow reductions in spillway design requirements where engineering data can show that the reductions do not come at the cost of public safety.
192	J. Eldon Rucker (Lake of the Woods Association, Inc.)	Table 1 of the of the current regulations states that it was not the intention to establish rigid design flood criteria and "Safety must be evaluated in the light of peculiarities and local conditions for each impounding structure and in recognition of the many factors involved," again requiring the judgment of competent and experienced professional engineers. Unfortunately, statements such as these have been removed from the proposed regulations.	The regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "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." It is expected that engineering judgment will still be applicable to areas including, but not necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
193	J. Eldon Rucker (Lake of the	In reviewing the proposed regulations and associated background information, it appears that a major objective of the new	The regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be

	Woods Association, Inc.)	proposal is to remove the distinction between existing and proposed dams. One important aspect of the current dam safety regulations is recognition that judgment of competent professional engineers should weigh heavily into dam safety evaluations. Section 130 of the current regulations provides considerations for dams constructed prior to the enactment of the Virginia Dam Safety Regulations, including issuance of regular operation and maintenance certificates to dams that may not satisfy current criteria but do not pose an unreasonable hazard to life and property. Sound engineering judgment on the part of competent professional engineers has been required to make these determinations.	made. Subsection (E) of section 20 provides that "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." It is expected that engineering judgment will still be applicable to areas including, but not necessarily limited to, hazard classification (section 40) and incremental analysis (section 52).
194	J. Eldon Rucker (Lake of the Woods Association, Inc.)	The Economic Impact Analysis by the Virginia Department of Planning and Budget dated May 4, 2007 states: "Thus the estimated total required spillway design upgrade costs would be $248,954,375." Based on actual cost data from Lake of the Woods and other recent dam work in the state, it is reasonable to expect the actual cost to modify the state's dams and those owned by local governments to the proposed regulation standards may well exceed this amount.	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
195	J. Eldon Rucker (Lake of the Woods Association, Inc.)	It is stated that inundation zone maps average $16,417 and that the estimated cost for all dams would be $7.6 million. We have completed this task at a cost of $37,400 and believe that the estimate does not adequately reflect the real world. It is wasteful of	Requirements in the regulations that would cause the need for upgrades to impounding structures have been amended and it is believed that this amendment will result in significant cost savings from the estimated cost of the regulations that were initially

		economic resources to require expenditure of hundreds of millions of dollars without adequately assessing the specific risks involved.	proposed by the Board. The estimates contained in the economic analysis for the proposed regulations were based on a national study on dam repair and upgrade costs entitled, "The Cost of Rehabilitating our Nation's Dams: A Methodology, Estimate, and Proposed Funding Mechanisms; Prepared by a Task Committee of the Association of State Dam Safety Officials; December 2002, Revised October 2003". It was specifically recognized in the "significant qualifiers" portion of the economic analysis that these costs may have risen since the time of that report and may continue to rise over time. Other cost information, including dam break inundation zone mapping and incremental analysis, were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.
196	J. Eldon Rucker (Lake of the Woods Association, Inc.)	The proposed regulations do not appropriately consider current operating, maintenance, and emergency action plans for dams that have been in existence for a long period of time. The current spillway has adequately handled runoff for a 40 year period during which time a number of significant storm events have occurred. The proposed PMP event far exceeds any reasonable design requirement should be re-evaluated based on more reasonable assumptions (i.e. 500 or 1000 year events) or use of site-specific circumstances which appropriately consider actual risk.	Data shows that severe rainfall events approaching the PMF can and do occur. Virginia, as evidenced by a presentation made to the technical advisory committee, is in fact situated such that these events must be considered in ensuring the safe design, construction, and operation of impounding structures. To illustrate the point, two of the five most intense 12-hour storm events in recorded United States history occurred in Virginia (Nelson County in 1969 and Madison County in 1995). A third also occurred in the greater Mid-Atlantic region (Smethport, PA in 1942). The regulations do, however, contain an opportunity for a site-specific analysis to be completed. The incremental analysis is contained in section 52 of the regulations and allows for a reduction of the required spillway design flood where it can be shown that such a reduction will not cause an increased threat to life and property.
197	J. Eldon Rucker (Lake of the Woods Association, Inc.)	The statement on page 4145 of the proposed regulations, "there is insufficient data to accurately compare the magnitude of the benefits versus costs…" must be reconsidered. We as a nation compute risk of loss of life versus the cost to reduce that risk	The regulations are the result of the work of a technical advisory committee process that extended over a six-month period and included dam owners, consultants, localities, state and federal representatives, and others. Much discussion and analysis

		and make decisions daily in the automobile, aircraft, and drug industries. VDOT makes that trade off every time they size a culvert or decide on a traffic light. I believe that our state's promise of a "common-sense" and "fiscally responsible" approach to government strongly suggests a similar approach in the case of the proposed regulations.	was completed during this process and during the process following the TAC that resulted in the economic impact analysis for the proposed regulations, as well as during the public comment period on the proposed regulations. It is believed that the final product of this work is a set of regulations that effectively meet the Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq.) to promote the safe design, construction, operation, and maintenance of Virginia's dams, while be cognizant of dam owner concerns and circumstances.
198	John S. Bailey (Lake of the Woods Association, Inc.)	Regarding storm durations, distribution models, etc., please make sure that we do not eliminate or place restrictions on any of the technical methods recognized by FEMA. This could apply to storm durations, as included in the proposed regulations. However, it could also include distribution models and other technical and non-technical criteria.	It is believed that the regulations do not limit any technical methods recognized by FEMA. FEMA references are permitted to be used by the regulations in section 330.
199	John S. Bailey (Lake of the Woods Association, Inc.)	It has been said that the creation of the Incremental Damage Assessment (IDA) is the same as the current Section 130, it is just putting into the regulations what the current practice is. However, the implementation of Section 130 is a far cry from how it used to actually work. Formerly, division staff would work jointly and creatively to resolve some of the more troublesome issues faced by dam owners and the results were not just the pouring of concrete. This seemingly is no longer the case. This is not a reflection on the expertise of staff, rather it is a comment on the limitations as to how public policy is being implemented.	The incremental analysis contained in section 52 is intended to make the Section 130 process available to all eligible dams as it has been implemented by current Dam Safety staff. The process adopted for the incremental analysis was approved by the technical advisory committee (TAC) that assisted with the development of the regulations, and the TAC did not agree to expand the incremental analysis to include other factors.
200	John S. Bailey (Lake of the Woods Association, Inc.)	Furthermore, the debate included discussion about whether or not specific IDA procedures should be incorporated into the regulations or be created as a set of internal guidelines to be used by staff and the respective dam owners. It was ultimately decided to not place them into the proposed changes. However, one technical element was included, that being water at 2 feet in depth and moving at a rate of 3 feet per second, and that seems to be the limit of the IDA factors to be considered. Why shouldn't other factors, such as those identified by the Ad-Hoc Committee also be included in the regulations? Without doing	The regulations have been revised to adopt the Rule of 7s in the incremental analysis, which specifies that an additional downstream threat to persons or property is presumed to exist when water depths exceed two feet or when the product of the water depth (in feet) and the average floodplain flow velocity (in feet per second) is greater than seven. The technical advisory committee that assisted with the revision of the regulations had extensive discussions concerning methods for reducing the spillway design

		so, staff and dam owners have nothing to guide them.	flood requirements for a dam. In fact, a subcommittee of the TAC was established for the purposes of discussing an alternative design matrix. In the end, however, the TAC believed that it was not appropriate to consider factors that might not be protective of public safety.
201	John S. Bailey (Lake of the Woods Association, Inc.)	Conspicuously missing from the proposed regulations are any mechanisms that would provide for risk analysis, profiling, and/or ranking of dams. There are approximately 1,600 impoundments in the Commonwealth that fall under the regulatory authority of DCR. Risk analysis profiling using systems that are already being used, such as by NRCS and as outlined in soon to be released FEMA documents, should be applied to all dams in the Commonwealth. Doing so would ensure that the limited funding available, for public and private dams, would be spent on those dams identified as requiring the most urgent of actions to protect public safety.	The technical advisory committee that assisted with the revisions of the regulations chose not to adopt a risk-based approach; rather, it is believed that all dams should be safe. Since the time of the expansion of the number of dams subject to the Board's regulations due to a change to the Code of Virginia (2002), the Department has actively worked to accurately identify and assess regulated dams across the Commonwealth.
202	J. Eldon Rucker (Lake of the Woods Association, Inc.)	Lake of the Woods is concerned that the proposed revision of the regulations attempts to eliminate all risk associated with dam safety; however, it will, in fact, result in limited increase in safety but at a huge cost to Virginia taxpayers. The Administration needs to keep its early "Moving Virginia Forward" promise of a "common-sense and fiscally responsible approach to government. . . ."	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. It is of note that the required spillway design floods contained in Table 1 of section 50 have been significantly amended from the values contained in the proposed regulations. The changes made to the regulations additionally include the availability of an incremental damage analysis to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund

			to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
203	J. Eldon Rucker (Lake of the Woods Association, Inc.)	There continues to be a total avoidance of risk philosophy by DCR. The *Virginia Register of Regulations* states on page 4145, "Implementation of these regulations will reduce such dam failures", and later on the same page, "There is insufficient data to accurately compare the magnitude of the benefits versus the costs for other changes." In plain English all this means is no one is willing to say how many dam failures they expect in the next few decades if the regulation is not changed and how many fewer would occur with the change. We as a nation compute risk of loss of life versus the cost to reduce that risk, and make decisions daily based on those calculations in the automobile, aircraft, and drug industries. VDOT makes that tradeoff every time they size a culvert or decide on a traffic light.	The regulations are the result of the work of a technical advisory committee process that extended over a six-month period and included dam owners, consultants, localities, state and federal representatives, and others. Much discussion and analysis was completed during this process and during the process following the TAC that resulted in the economic impact analysis for the proposed regulations, as well as during the public comment period on the proposed regulations. It is believed that the final product of this work is a set of regulations that effectively promote the safe design, construction, operation, and maintenance of Virginia's dams, while be cognizant of dam owner concerns and circumstances. It is recognized the uncertainties exist regarding the number of impounding structure failures that may occur in the future. As recognized by section 20(C), natural (including weather) and man-made (such as sabotage) events may never be completely planned for. Nevertheless, the Board is required to establish a Dam Safety program that is designed to protect lives and property to the maximum extent possible.
204	J. Eldon Rucker (Lake of the Woods Association, Inc.)	Proposed FEMA dam risk prioritization documents, provided by the Association of State Dam Safety Officials, state that there is a point where "risk has been reduced as low as reasonably practical [ALARP]. This reasonableness test reflects society's aversion to incidents that can potentially cause large loss of life but recognizes that there is a point of diminishing returns. ALARP is defined as the point where additional risk reduction is not possible without a disproportionate investment for the benefit gained."	The technical advisory committee (TAC) that assisted with the development of the regulations considered the subject of whether or not one human life should be sufficient to cause a change in hazard classification. After discussion, it was determined that any loss of human life was unacceptable and that the regulations should take all actions necessary to ensure safety.
205	J. Eldon Rucker (Lake of the	There are significant benefits that are likely to exceed the costs related to a number of non construction actions including inspection and	It is agreed that upgrades to EAPs and dam break inundation zone mapping requirements will benefit public safety.

	Woods Association, Inc.)	emergency action procedures, including evacuation. Clearly, the estimated $9 million price to dam owners to implement improvements to Emergency Action Plans and associated inundation zone mapping is cost-effective. While Katrina left a bad reputation for "Evacuation", studies of dam failures and resulting damages indicate evacuation can be 98% effective.	
206	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Proposed Change: Delete the phrase in paragraph A "or the dam is six feet or greater in height and creates a maximum impounding capacity of 50 acre-feet or greater." Comment and rationale This adds a new category of dams, which was not previously designated in Table 1 of the original regulation. This new category is significantly smaller than current dams excepted for agriculture purposes. This will add an undetermined number of dams, ranging between six and 25 feet in height, to the workload of the of the dam safety officials while agriculture dams of similar or larger dams are exempt from regulation. If this size structure is a safety issue, either both should be regulated If not, neither should be considered.	Notwithstanding the language contained in the current Table 1, the department has been regulating dams of the size noted by the comment since an amendment made to the Dam Safety Act (§10.1-604 et seq.) mandated regulation in 2002. Amending Table 1 to include such dams aligns the table with the remainder of the regulations and agency practice, and will not create an additional workload for the department.
207	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Add the following: D. PMF: Probable Maximum Flood <u>represents the flood magnitude expected to be equaled on the average of once in 10,000 to one million years. It</u> is the flood that might be expected . . . . Comment and rationale: Since the flood magnitude is listed for the 100-Yr and 50-Yr floods, a similar number should be listed for the PMF. According to NOAA, the PMF is not expected to be exceeded.	It is believed that the proposed addition would be inappropriate, as there is no frequency for the PMF storm, which is the largest deemed probable to occur.
208	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Proposed Change: Reinstate proposed deletion from Footnote D: "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	Section 50 has been revised to include language similar to that requested by the comment. This language now provides, "In some cases, a modified PMF may be calculated utilizing local topography, meteorological conditions, hydrological conditions, or PMP values supplied by

		agencies to obtain the prevailing practice in specific cases." Comment and rationale: Recommended in order to help put consideration of engineering judgment, local conditions and common sense into the proposed regulations.	NOAA."
209	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC-50-20-40 Proposed Change: Add the following sentence to B.1 (and similar language to B.2 and B.3): "Probable" loss of life or "serious" economic damage will be determined after consultation with local county or municipal emergency planning officials with consideration given to probability of storm events and adequacy of emergency action plans and procedures.	While emergency action plans and coordination with emergency officials is intended to assist with preventing the loss of life in the event of an emergency at a dam, the dam's actual risk is dependent upon conditions determined by engineering considerations, and not by those of individuals and agencies. A definition of "probable loss of life" has been added to the regulations.
212	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC-50-20-40. Proposed Change: Add the following to paragraph D: No additional expansion of a spillway will be required unless the inflow is increased by more than 20%. Comment and rationale: To prevent unnecessary expenditures due to future dynamic changes in dam design criteria.	The department is aware of no basis for the suggestion that a 20% increase has no impact on public safety. Therefore, the suggested amendment has not been made.
213	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Proposed Change**:** Set the maximum SDF for SIGNIFICANT hazard potential class at 0.5 PMF Comment and rationale: SDF should be based on hazard potential class, not size. Increasing Spillway Design Flood for class II dams to .75 PMF will make many of the currently acceptable class II dams out of compliance. The price to make this spillway increase will be in the hundreds of millions.	Table 1 has been amended to set the maximum SDF for significant hazard potential dams to 0.5 PMF.
214	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Proposed Change: Retain Note C as written in current regulation, which reads, "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	The regulations continue to recognize that engineering judgment is necessary and will be a large factor in determinations to be made. Subsection (E) of section 20 provides that "design, inspection and maintenance of impounding structures shall be conducted utilizing competent, experienced, engineering judgment that takes into consideration factors including

		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." Comment and rationale: The key to safety is "competent, experienced engineering judgment which the values in Table 1 are intended to supplement, not supplant."	but not limited to local topography and meteorological conditions." The standards set forth by Table 1 are believed to be the minimum necessary to protect public safety. The regulations do, however, provide an opportunity for an incremental analysis to be conducted to reduce the spillway design flood requirement where it can be shown that public safety will not be harmed by such a reduction.
215	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-50 Proposed Change: Change the following sentence to read**, "**The hydrograph that creates the largest peak ~~outflow~~ inflow is to be used to determine capacity for nonfailure and failure analysis." Comment and rationale: Capacity should be determined by inflow hydrographs The computation of an inflow hydrograph is a function of the watershed characteristics, while an outflow hydrograph is both function of inflow and dam design, including reservoir characteristics, dam height, spillway characteristics, and gate(s) operating procedures. The setting of SDF design based on the outcome of that design is circular logic.	Inflow does not necessarily equate with peak pool elevation. In contrast, peak pool elevation will equate with peak outflow. The technical advisory committee that assisted with the development of the regulations discussed this topic and determined that peak outflow was the appropriate criteria.
216	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-52. Proposed change**:** Revise paragraph B.5. to read: "..the impounding structure as designed, constructed, operated and maintained does not pose an unreasonable hazard to life and property. Site-specific conditions may be recognized and considered. Conditions may be evaluated using approved criteria such as the Critical Design Flood Guidelines and other recognized agency guidelines." Comment and rationale: The proposed 4VAC50-52 Incremental Damage Assessment**,** does provide for reduction of the spillway design flood requirement, similar to the provisions of the existing 4VAC 50-20-130. However, it lacks a specific methodology. Examples include the "Ohio Critical Flood Guidelines" and the proposed "FEMA Users Manual: Prioritization of Dams Through Risk Categorization". ,	Subsection B of section 52 of the proposed regulations has been removed from the regulations. It is intended that site-specific conditions be considered in performing an incremental damage analysis. A statement recognizing this has been added to the new subsection B of section 52.
217	J. Eldon Rucker	4VAC50-20-54. Proposed Change**:** Revise D.2. A dam break	The requested amendments have been made to sections 54(D)(2) and (D)(3). A

	(Lake of the Woods Association, Inc.)	analysis utilizing ~~a probable maximum flood~~ the designed Spillway Design Flood (SDF) with a dam failure; and Revise D.3. A dam break analysis utilizing ~~a probable maximum flood~~ the designed Spillway Design Flood (SDF) without a dam failure. Comment and rationale: If the effects of failure using the designed hazard potential classification criteria for the dam (i.e. Significant Hazard Potential) meet the criteria outlined in 4VAC50-20-40 for loss of life or economic damage, then there is no reason to measure the effects of a higher level (PMF) flood.	requirement for a dam break analysis utilizing the probable maximum flood has been retained, however, in order to allow for accuracy in determining the hazard potential classification of an impounding structure, both under current conditions and in response to future development.
218	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-70. Construction permits. Proposed Change**:** Clarify B.6.g. Freeboard-normal pool to top of dam (feet). Comment and rationale: This definition of freeboard conflicts with the definition in 4VAC50-20-30, "the vertical distance between the maximum water surface elevation associated with the spillway design flood and the top of the impounding structure." This conflict also appears in other places.	Section 70(B)(7)(g) has been amended to eliminate this inconsistency.
219	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-125. Proposed Change**:** Change Paragraph A to read: A. If an impounding structure has been determined to have an adequate spillway capacity prior to the effective date of these regulations and is currently operating under a Regular or Conditional Operation and Maintenance Certificate, but will now require spillway modifications due to changes in these regulations, the owner shall submit to the board an Alteration Permit Application in accordance with 4VAC50-20-80 to address spillway capacity at the time of the expiration of their Regular or Conditional Operation and Maintenance Certificate or within three years of the effective date of these regulations, whichever is later. Comment and rationale: The schedule changes should apply to all dams. All dams are affected by the changes in spillway design regulations. Page 4147 of the Virginia Register of Regulations states, "Additionally,	Conditional certificates have been issued under the current regulations for dams that are in need of repair and/or upgrade regardless of the changes to the regulations proposed by this action, and it is not believed to be appropriate to grant a delayed effective date to these structures. For impounding structures that do not receive a delayed effective date, the Board will continue to utilize the existing conditional certificate process, which emphasizes progress by an impounding structure owner toward coming into compliance with regulatory standards. This process allows the particular situation of each impounding structure to be considered independently and for achievable timelines to be set.

		there are 39 dams that are currently noncompliant, (that means Conditional Certificate) as they already require a spillway upgrade, but the change in the regulations will require upgrading to a higher standard."	
220	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-165. Proposed Change: Delete this section. Comment and rationale: It is proposed that all dams, public, private, federal, state, agricultural and those authorized by the State Corporation Commission be subject to the same requirements. This will require modification of 10.1-604 of the Code of Virginia. This rationale assumes that the true purpose of the revised regulation is personnel and property safety.	As alluded to by the comment, the agricultural exemption is set forth in the Dam Safety Act (§10.1-604 et seq.), and removing that exemption would require a legislative action. The Board does not have the authority to remove the agricultural exemption through this regulatory action.
221	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-175. Proposed Change: Paragraph E. Delete "provide a critique of the exercise or exercises and any revisions or updates to the EAP or a statement that no revisions or updates are needed." Comment and rationale: Since no criteria is set for drills, no purpose is served by generating a critique for review at the State level. EAPs are best evaluated at the local level. Any required updates to the EAP is addressed in Paragraph D.	The requested amendment has been made to section 175(E). Dam owners are not required to provide a critique of exercises.
222	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-175. Proposed Change: Paragraph G.1. Delete "The notification chart shall include contact information providing 24-hour telephone coverage for all responsible parties." Comment and rationale: From a practical viewpoint, notification concerning a Stage III Condition (or Sunny day dam failure) will be through local 911 emergency agencies, which would be responsible for alerting the Virginia Department of Emergency Management and other similar organizations. It is unlikely that any dam owner would be able to maintain a current 24-hour list of non-local responsible parties such as the DCR staff.	Section 175 has been amended to clarify the parties intended to be contacted by the dam owner. The dam owner is responsible for developing a notification chart demonstrating how parties affected by a dam failure will be notified; local emergency management agencies may be a method of notification.
223	J. Eldon Rucker (Lake of the Woods	4VAC50-20-175. Proposed Change: Paragraph G.7. Change first sentence to read: <u>The EAP shall include a section that identifies all parties with</u>	The requested amendment has been made to section 175(G)(7).

	Association, Inc.)	assigned responsibilities in the EAP pursuant to this subdivision 3 of this subsection. This will include certification that the EAP has been delivered to these parties. The preparer's name . . . Comment and rationale: From a practical viewpoint, it is unlikely that all of the agencies involved will provide signed receipts.	
224	J. Eldon Rucker (Lake of the Woods Association, Inc.)	4VAC50-20-320. Proposed Change**:** Change Item 6 to read: "Other design and guidance procedures …" Comment and rationale: This should specifically include reference to other state guidance documents which have been found useful to dam safety programs. If Virginia does not provide for specific guidance for damage assessment, then successful procedures used by other states should be considered.	Guidance adopted by other states is specific to the regulations of those states and it would not be appropriate to assume that such guidance would apply to the Board's regulations. The regulations do provide for the utilization of manuals, guidance, and criteria utilized by the Federal Emergency Management Agency in section 330.
225	Lisa Cahill (Watershed Services)	Regarding the regulations, please provide the forms in such a way that they can be filled out on the computer. And on behalf of comments from engineering firms, including some sort of mail merge or way to fill the forms out in mass would be very helpful for those who may have twenty of these to do.	The Department recognizes this request and is working toward achieving technological advances in forms.
226	Lisa Cahill (Watershed Services)	What we learned in Gaston is that we can't rely on our infrastructure. An EAP may not be as effective as we think if we are relying on phone lines, power being present and roads. Because as reliable and as major a road as Route 301 is, it was completely breached in Gaston.	While effective EAPs will function to assist with the protection of individuals and property in an emergency situation, it is recognized that EAPs cannot be relied upon alone to protect public safety. Therefore, the regulations do require that dams be designed, constructed, operated and maintained in a manner that is protective of public safety.
227	Robert F. McCarty	These proposed regulations will increase the spillway design requirements to pass a greater storm flow than is currently required and these regulations would be applicable to all new impoundments, as well as, existing structures which now meet requirements. It is questionable why these higher standards are required when, to my knowledge and research, there has not been a dam failure resulting in any fatalities since the Timberlake Dam failure in 1995 which claimed two lives.	The spillway design flood requirements contained in section 50 of the regulations has been revised significantly from the values contained in the proposed regulation. Notwithstanding the language of the version of section 50 that has been effective to date, the Board's practice has been to require the same spillway design flood standards of both old and new dams. The amended regulations reflect this practice. Further, the

			issue of whether there should be a distinction between new and existing dams was discussed extensively by the technical advisory committee that assisted with the development of these regulations. As public safety depends upon the design and condition of a dam, and not its age, it was determined by the TAC that such a distinction would be inappropriate.
228	Robert F. McCarty	Almost all of the required spillway design floods will exceed the 50-year design storm required for Interstate highway bridges over streams, which if washed out, would most probably result in more loss of life than an impoundment structure failure.	The Board's mandate pursuant to the Dam Safety Act (§10.1-604 et seq.) is to adopt regulations that provide for the safe design, construction, operation, and maintenance of Virginia's impounding structures. While other types of infrastructure, including highways, may be designed to criteria different than that required for impounding structures, the Board must set forth the requirements that it believes are necessary to carry out its mandate pursuant to the law.
229	Robert F. McCarty	Since the proposed regulations will retroactively apply to all of the nearly 1,700 regulated dams in the state this will require new hydraulic studies, engineering surveys, dam break analyses, incremental damage analyses, inundation dam break analyses and mapping, and hydrographs for 6, 12, and 24 hour duration design storms. All of these studies must be done by a licensed professional engineer. Considering that there are approximately 25,000 registered professional engineers in the Commonwealth, and less than 10 percent are practicing civil engineers of which very few have training or experience in conducting the above studies and analyses, it is questionable that there is enough engineering expertise to comply with the timeframe in the regulations.	It is believed that there will be sufficient engineering resources to cover the needs of dam owners. The Department does maintain a list of engineers and engineering firms that have expressed interest in working with dam owners in order to assist dam owners with securing engineering services.
230	Robert F. McCarty	It is unlikely that the small staff at the Dam Safety and Floodplain Management Division will be sufficient to adequately review all of the required documents, studies, and analyses in a timely manner.	It is believed that the Department has sufficient staffing to administer the Dam Safety Program under the revised regulations. Additionally, the Department continues to seek additional staffing for the Division of Dam Safety and Floodplain Management.
231	Robert F. McCarty	Based on recent estimates it could cost as much as $20,000 to $25,000 just for the engineering costs related to each impoundment, which could amount to more than $36,000,000 if all impoundments have to	The estimates contained in the economic analysis for the proposed regulations were developed through receiving estimates from various engineering firms that perform work on impounding structures in Virginia.

		be studied.	
232	Robert F. McCarty	Considering also, that these costs do not include the fees that would be established by the proposed regulations, this is a tremendous cost to the owners, counties, and localities responsible for these dams.	Fees have been established pursuant to the authority granted to the board by section 10.1-613.5 of the Code of Virginia. These fees are intended to cover the cost of a small portion of the administration of the Dam Safety program, and have been purposely set at levels that are believed to be as minimal as possible. In fact, the fee amounts provided for by the regulations have been further reduced from the values contained in the proposed regulations.
233	Robert F. McCarty	Dam owners and home owners associations are strapped with recent real estate taxes going up so much and will be resistant to any newly required expenditures of this magnitude. Most likely, little will be done unless some sort of funding can be made available.	It is recognized that upgrades and repairs to dams are often very expensive. The Dam Safety program, however, is tasked with ensuring the safe construction, operation and maintenance of the Commonwealth's dams through implementation of the Board's regulations. The changes made to the regulations are intended to minimize the costs associated with upgrades to dams to the extent possible while ensuring that an adequate level of public safety is maintained. The changes made to the regulations additionally include the availability of an incremental damage analysis (insert section number) to all dams. This analysis allows the required spillway design of a dam to be reduced where it is shown that failure of the dam during a specific flood condition will not cause an additional downstream threat. The Department continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.
234	Robert F. McCarty	4VAC50-20-54. E.2. appears to be a disclaimer clause. Is that the intent?	The statement contained in section 54(F)(2) has been amended to more accurately reflect the intention of the statement contained in that section.
235	Robert F.	Part VI covers fees for all permits and	The regulations establish no fee for an

	McCarty	certificates with the exception of Alteration Permits. It is assumed that was intentional and not an oversight on the part of the Board.	alteration permit. This was done intentionally in order to encourage the repair and upgrade of dams needing work.
236	Robert F. McCarty	I feel the proposed regulations go overboard in that they will retroactively increase design spillway flood requirements on existing impoundment structures and will require more studies and costs. It would make more sense to enforce existing regulations to get all existing dams into compliance and not burden the public with the tremendous cost that these proposed regulations would impose.	The Board is charged by the Dam Safety Act, § 10.1-604 et seq. of the Code of Virginia, to adopt regulations that ensure the safe design, construction, operation and maintenance of Virginia's impounding structures. In conducting this revision to the regulations, which were last reviewed comprehensively in 1989, the Board must be guided by its mandate. While it is recognized that many impounding structures still need additional work to become compliant with current requirements, waiting to adopt proper standards will do little more than cause these structures to undergo two upgrades instead of one (one in order to meet current standards, and then another to meet revised standards at a later date should the standard be increased). This would increase the overall burden to impounding structure owners. To assist impounding structure owners with compliance, the Department continues to seek additional staffing in order to provide additional outreach and guidance. The Department also continues to advocate for funding for the Dam Safety, Flood Prevention and Protection Assistance Fund to be made available to dam owners to assist with upgrades and repairs to their dams. The Fund was authorized to make financial assistance available to dam owners as a result of legislation passed during the 2006 General Assembly and an initial loan round is being conducted between December 1, 2007 and February 1, 2008.