Pocahontas Building Information

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Attendees are not entitled to be disorderly or disrupt the meeting from proceeding in an orderly, efficient, and effective fashion. Disruptive behavior may result in a recess or removal from the meeting.

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Attendees shall not block or gather in exits, doors, or aisles.

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All violators are subject to removal.

TENTATIVE AGENDA AND MINIBOOK
STATE WATER CONTROL BOARD MEETING

THURSDAY, DECEMBER 13, 2018
FIRST FLOOR HOUSE COMMITTEE ROOM
POCAHONTAS BUILDING, 900 EAST MAIN STREET
RICHMOND, VIRGINIA 23219

Convene – 10:00 a.m.

	AGENDA ITEM	**DEPARTMENT PRESENTER**	**TAB**
Introductions			
I.	**Election of Officers**		
II.	**Minutes** (August 21, 2018 and September 20, 2018)		A
III.	**Regulation – Final**		
	General VPDES Permit for Pesticide Discharges (9VAC25-800)	Sherman	B
	Water Quality Standards Amendments - Ammonia (9VAC25-260)	Kennedy	C
IV.	**TMDL Reports and Wasteload Allocations**	Meadows	D
	Approve Two TMDL Reports and Adopt Seven New Wasteload Allocations		
V.	**Significant Noncompliance Report**	Sadtler	E
VI.	**Consent Special Orders - VWP**	Williams	F
	Piedmont Neighborhoods, LP, Whittington Subdivision (Albemarle Co.)		
VII.	**Public Forum (time for this item not to exceed 45 minutes)**		
VIII.	**Other Business**		
	2019 Virginia Revolving Loan Fund Final Authorizations	Doran	G
	Division Director's Report/Atlantic Coast Pipeline	Schneider/Golden	
	Future Meetings		

ADJOURN

NOTE: The Board reserves the right to revise this agenda without notice unless prohibited by law. Revisions to the agenda include, but are not limited to, scheduling changes, additions or deletions. Questions on the latest status of the agenda should be directed to Cindy M. Berndt at (804) 698-4378.

PUBLIC COMMENTS AT STATE WATER POLLUTION CONTROL BOARD MEETINGS: The Board encourages public participation in the performance of its duties and responsibilities. To this end, the Board has adopted public participation procedures for regulatory action and for case decisions. These procedures establish the times for the public to provide appropriate comment to the Board for its consideration.

For REGULATORY ACTIONS (adoption, amendment or repeal of regulations), public participation is governed by the Administrative Process Act and the Board's Public Participation Guidelines. Public comment is accepted during the Notice of Intended Regulatory Action phase (minimum 30-day comment period) and during the Notice of Public Comment Period on Proposed Regulatory Action (minimum 60-day comment period). Notice of these comment periods is announced in the Virginia Register, by posting to the Department of Environmental Quality and Virginia Regulatory Town Hall web sites and by mail to those on the Regulatory Development Mailing List. The comments received during the announced public comment periods are summarized for the Board and considered by the Board when making a decision on the regulatory action.

For CASE DECISIONS (issuance and amendment of permits), the Board adopts public participation procedures in the individual regulations which establish the permit programs. As a general rule, public comment is accepted on a draft permit for a period of 30 days. In some cases a public hearing is held at the conclusion of the public comment period on a draft permit. In other cases there may an additional comment period during which a public hearing is held.
In light of these established procedures, the Board accepts public comment on regulatory actions and case decisions, as well as general comments, at Board meetings in accordance with the following:

REGULATORY ACTIONS: Comments on regulatory actions are allowed only when the staff initially presents a regulatory action to the Board for final adoption. At that time, those persons who commented during the public comment period on the proposal are allowed up to 3 minutes to respond to the summary of the comments presented to the Board. Adoption of an emergency regulation is a final adoption for the purposes of this policy. Persons are allowed up to 3 minutes to address the Board on the emergency regulation under consideration.

CASE DECISIONS: Comments on pending case decisions at Board meetings are accepted only when the staff initially presents the pending case decision to the Board for final action. At that time the Board will allow up to 5 minutes for the applicant/owner to make his complete presentation on the pending decision, unless the applicant/owner objects to specific conditions of the decision. In that case, the applicant/owner will be allowed up to 15 minutes to make his complete presentation. The Board will then allow others who commented at the public hearing or during the public comment period up to 3 minutes to exercise their rights to respond to the summary of the prior public comment period presented to the Board. No public comment is allowed on case decisions when a FORMAL HEARING is being held.

POOLING MINUTES: Those persons who commented during the public hearing or public comment period and attend the Board meeting may pool their minutes to allow for a single presentation to the Board that does not exceed the time limitation of 3 minutes times the number of persons pooling minutes, or 15 minutes, whichever is less.

NEW INFORMATION will not be accepted at the meeting. The Board expects comments and information on a regulatory action or pending case decision to be submitted during the established public comment periods. However, the Board recognizes that in rare instances new information may become available after the close of the public comment period. To provide for consideration of and ensure the appropriate review of this new information, persons who commented during the prior public comment period shall submit the new information to the Department of Environmental Quality (Department) staff contact listed below at least 10 days prior to the Board meeting. The Board's decision will be based on the Department-developed official file and discussions at the Board meeting. In the case of a regulatory action, should the Board or Department decide that the new information was not reasonably available during the prior public comment period, is significant to the Board's decision and should be included in the official file, the Department may announce an additional public comment period in order for all interested persons to have an opportunity to participate.

PUBLIC FORUM: The Board schedules a public forum at each regular meeting to provide an opportunity for citizens to address the Board on matters other than those on the agenda, pending regulatory actions or pending

case decisions. Those persons wishing to address the Board during this time should indicate their desire on the sign-in cards/sheet and limit their presentations to 3 minutes or less.

The Board reserves the right to alter the time limitations set forth in this policy without notice and to ensure comments presented at the meeting conform to this policy.

Department of Environmental Quality Staff Contact: Cindy M. Berndt, Director, Regulatory Affairs, Department of Environmental Quality, 1111 East Main Street, Suite 1400, P.O. Box 1105, Richmond, Virginia 23218, phone (804) 698-4378; fax (804) 698-4346; e-mail: cindy.berndt@deq.virginia.gov.

VPDES General Permit Regulation for Discharges Resulting from the Application of Pesticides to Surface Waters (VAG 87); Amendments to 9VAC25-800 and Final Reissuance of General Permit: The current VPDES General Permit Regulation for Discharges Resulting from the Application of Pesticides to Surface Waters will expire on December 31, 2018 and the regulation establishing this general permit is being amended to reissue this general permit for another five-year term. The Board's authorization of the proposal was received at the August 21, 2018 meeting. A Public Comment Period (NOPC) was held from September 18, 2018 to November 16, 2018 with a public hearing held on October 18, 2018. There were no attendees at the public hearing. No public comments were received on the proposed changes to the general permit regulation.

Substantive changes to the existing regulation are:

- Section 20 [Also sections 30 and 60] – *Purpose; delegation of Authority; effective date of permit*. Changing the effective and expiration dates because permit coverage will be administratively continued past the current expiration date.
- Section 10 – *Definitions*. Changed the citation for FIFRA definitions used in the definition of *active ingredient* to the relevant CFR definitions, based on the federal 2016 pesticide general permit.
    - Within the definition of *adverse incident*, removed the term "wildlife" from what is characterized as *toxic or adverse effects*, based on the federal 2016 pesticide general permit.
- Section 15 − *Applicability of incorporated references based on the dates that they became effective*. A statement was revised to update all Title 40 Code of Federal Regulations within the document to be those published as of July 1, 2018. This is a recommendation from the DEQ Office of Policy.
- Section 30 – *Authorization to discharge*. Under subsection C, Table 1, clarified that where a use category has both acres and linear miles annual treatment area thresholds, an operator need only meet one threshold to be subject to pesticide discharge management plan requirements.
    - In subsection F, clarified that compliance with this general permit does not negate the requirement to comply with applicable state wetland program requirements administered by DEQ and the Virginia Marine Resources Commission. The TAC identified lack of awareness of these wetland programs as a concern.
- Section 60 – *General permit*. Under Part I.D.5, deleted the DEQ address for the Blue Ridge Regional Office in Lynchburg since that office has been closed.
    - Under Part II, made minor edits to certain standard conditions to better suit VPDES general permits. These are global edits for VPDES general permits.

- Under Part II.I, revised the *Duty to reapply* standard condition to indicate that an operator that wishes to continue coverage after this permit expires must have coverage under a new permit. This change reflects the fact that no registration statement is required under this general permit.
- Under subsection S, revised the *Transfer of permit coverage* standards condition to indicate that permits are not transferable except after notice to DEQ and that transfer is not anticipated since coverage under this permit is automatic where an operator meets all eligibility requirements.

The only change from the proposal is to revise the effective and expiration date of the permit to March 1, 2019 and February 29, 2024, respectively.

Final Adoption of Water Quality Standards Regulation Amendments (9 VAC 25-260) – Section 155: Freshwater Ammonia Criteria: Staff will ask the Board to adopt proposed amendments to the Virginia Water Quality Standards Regulation, 9 VAC 25-260-155, specifically freshwater ammonia criteria for the protection of aquatic life. This recommendation is based on:

- Review of final EPA criteria recommendations issued in 2013 and technical support information,
- Comments received on the proposed amendments during two public review/hearing periods (Sept. 18 – Dec. 8, 2017, and Aug. 6 - Oct. 5, 2018),
- Input received from a Regulatory Advisory Panel over the course of this rulemaking, and
- A Virginia Code mandate enacted by the 2018 General Assembly requiring that the Board include in such adoption a Phased Implementation Program (PIP) consistent with the federal Clean Water Act.

SUBSTANCE OF PROPOSED AMENDMENTS

In August 2013, the Environmental Protection Agency (EPA) published updated nationally recommended freshwater ammonia criteria for the protection of aquatic life. Like the current criteria, the proposed criteria are calculated as a function of temperature and pH and account for the presence or absence of trout and early life stages of fish. In general, the toxic effects of ammonia on aquatic life become more pronounced with increasing pH and temperature.

Based on the most recent scientific studies, the recalculated ammonia criteria now incorporate toxicity data for freshwater mussels and snails, which are the most sensitive organisms in the recalculation data base. The new criteria are about twice as stringent as the existing criteria primarily because more recent toxicity data show that mussels and snails (including endangered species) are very sensitive to ammonia and the current ammonia criteria do not provide sufficient protection for these species. Site specific options to calculate criteria omitting mussel toxicity data are proposed to be used in waters where a demonstration has been made that mussels are absent; however, consultation with U.S. Fish and Wildlife Service and the Virginia Department of Game and Inland Fisheries indicate freshwater mussels should be considered ubiquitous in Virginia and likely to be present in any perennial waterbody.

Table 1. EPA's 2013 Final Freshwater Aquatic Life Criteria for Ammonia

CRITERIA* (Assumed pH = 7.0; T = 20^{o} C)	CONCENTRATION (mg/L total ammonia nitrogen)
Acute (1-hour average)	17

Chronic (30-day rolling average)	1.9**

* Criteria Frequency: Not to be exceeded more than once in 3 years on average.
** Not to exceed 2.5 times the chronic concentration as a 4-day average within 30 days.

Compared to the current criteria, which were based on EPA recommendations issued in 1999, at pH 7 and 20°C the 2013 acute criterion magnitude is 1.4-fold lower than the current acute criterion. At this pH and temperature, the 2013 chronic criterion magnitude is 2.4-fold lower than the current chronic criterion. The decreases in criteria magnitudes reflect the inclusion of the new toxicity data discussed above.

Public Comment and DEQ Response

A. During the first public review period, which closed December 8, 2017, the following comments were received on the proposed ammonia criteria amendments:
   1. Commenter: Chesapeake Bay Foundation; expressed support for the proposed revisions with a 10-year compliance schedule for facilities that cannot meet permit limits; did not support allowing schedules to extend beyond this period.
      DEQ's Response: Acknowledge CBF's support for the proposed revisions.

   2. Commenter: U.S. Environmental Protection Agency; stated that DEQ should ensure the proposal is consistent with recommendations regarding duration and frequency of exceedance, specifying that the 4-day average of ammonia concentration (not to exceed 2.5 times the chronic criterion in a 30-day period) be included in the proposal.
      DEQ's Response: DEQ acknowledges the EPA 2013 recommendation for the 4-day average chronic criterion, but did not originally include this criterion in the proposed amendments. At that time, DEQ was relying on EPA's 1999 implementation guidance which provided for the allowance that a 30Q10 design flow when calculating steady state waste load allocations for dischargers should also be as protective as 2.5 times any 4-day average (Federal Register, FRL–6513–6 December 22, 1999-Implementation Guidance). "30Q10" means the lowest flow in the receiving stream, averaged over a period of 30 consecutive days that can be statistically expected to occur once every 10 climatic years. This factor was adopted into the Board's 2001 rulemaking (approved by EPA) for the ammonia criteria as footnote "6" to Section 140.B. EPA's guidance for the 2013 criteria is silent on this matter; therefore, DEQ assumed that the current wording in the Water Quality Standards Regulation was still valid and sufficient. EPA has since pointed out that the provision for use of the 30Q10 is in the implementation section of the 1999 guidance, not in the actual criteria recommendations. The proposed inclusion now of the 4-day average criterion is addressed in the Comment/Response section below, related to the most recent public comment period (Aug. 6 - Oct. 5, 2018).

   3. Commenters: Amherst Co. Service Authority (S.A.), August Co. S.A., Bath Co. S.A., Town of Culpeper, Frederick Water, City of Fredericksburg, Goochland Co. Dept. of Public Utilities, Halifax Co. S.A., Hampton Roads Sanitation District, Hanover Co., Harrisonburg-Rockingham Regional S.A., Henry Co. Public S.A., Town of Hillsville, Hopewell Water Renewal, Lee Co. Public S.A., Loudoun Water, Louisa Co. Water Authority, City of Norton, Pepper's Ferry Regional Wastewater Treatment Authority, Rapidan S.A., City of Richmond, Town of Tappahannock, Tazewell Co. Public S.A., Upper Occoquan S.A., Virginia Coal and Energy

Alliance, Inc., Virginia Association of Municipal Wastewater Agencies, Virginia Manufacturers Association, Virginia Rural Water Association, Virginia Water and Waste Authorities Association, Warm Spring Sanitation Commission, Wise Co. Board of Supervisors, Wythe Co. Public S.A.

Commenters expressed concern over the increased costs they predict will be incurred by permitted facilities due to the adoption of the updated ammonia criteria that may result in more stringent discharge permit limits. They requested that DEQ consider a long-term phased implementation plan that works in conjunction with the implementation of other nitrogen-based requirements (e.g., Chesapeake Bay TMDL), with assistance provided through the Water Quality Improvement Fund. Commenters also requested that DEQ make specific allowances for permit limits (e.g., the use of a 50th percentile pH value rather than 90th percentile pH value). Some commenters also request a delay in the adoption of the new criteria to allow for more refined planning.

DEQ's Response: The agency realizes there is potential for economic impacts to treatment facilities. This issue is addressed in the Comment/Response section below, related to the most recent public comment period (Aug. 6 - Oct. 5, 2018).

B. During the second public review period, which closed October 5, 2018, the following comments were received on the proposed ammonia criteria amendments. DEQ received 47 sets of comments from local governments, wastewater authorities, industrial dischargers, associations and representative organizations, one environmental group, one citizen, and the EPA. Most of the localities, Service Authorities, and Public Utilities operating municipal sewage treatment works provided very similar comments based upon recommendations developed by the Virginia Association of Municipal Wastewater Agencies (VAMWA) and were submitted using virtually the same format.

1. Shared Comments:
   a. The risk of financial hardship is extreme, particularly for small municipal wastewater systems, including many serving rural areas of the Commonwealth. Most of the commenters reference costs calculated by an engineering firm retained by VAMWA. Those cost estimates (in 2014 dollars) are $512 million in capital costs plus recurring annual operation and maintenance costs of $34 million as their best estimate of this impact on Virginia localities, wastewater authorities and utility ratepayers.

   DEQ's Response: DEQ acknowledges the potential fiscal impact on dischargers not currently controlling ammonia in their discharge and accepted the VAMWA cost estimates as representative. It was for this reason the original criteria amendments were proposed to include provisions for extended compliance schedules (beyond the term of a permit) based on demonstrated need to give time to secure necessary funding, plan, design and construct needed retrofits and cost-effectively address multi-purpose projects. This "strawman" language has now been replaced with the provisions for the Phased Implementation Program enacted by the 2018 General Assembly.

   b. Agree with the goal of providing appropriate protection for snails and mussels (the most sensitive species used in ammonia toxicity calculations) but believe spending on additional protection for those species should be considered in the context of the broader public interest including important societal needs, rather than mandating it, which forces snail and mussel protection as a priority over discretionary public spending. Costs for compliance with the more stringent criteria may result in unmet legitimate environmental and non-environmental

public needs such as schools and other locality infrastructure due to limited financial resources.
DEQ's Response: Both the federal Clean Water Act and Virginia's State Water Control Law mandate protection of designated uses, including aquatic life. This mandate is not given in the context of considering all other possible public interests and societal needs, but inclusion of the PIP in the ammonia criteria amendments is intended to lessen the impact on affected dischargers while achieving the requirement to protect aquatic life.

c. Most of the commenters provided information on their wastewater systems. Three of the localities are currently in various stages of progress to upgrade Combined Sewer Overflow (CSO) systems (Cities of Alexandria, Lynchburg, and Richmond) and they state that considerable financial resources have been, and continue to be spent, to ensure those projects are completed.
DEQ's Response – DEQ acknowledges the efforts made by permitted facilities to control discharge of pollutants of all types to Virginia's waters.

d. The majority of commenters recommended that DEQ include the Phased Implementation Plan (PIP) in the regulation with the added extension of 6 months for each facility tier. This would change the proposed 6, 18 and 30 months for Tiers 1, 2, and 3 respectively to 12, 24 and 36 months. It is also suggested that the design flow for the first tier of facilities should be changed from 1.0 MGD and greater design capacity (DEQ's proposal) to 5.0 MGD and greater capacity. They state owners of facilities greater than 5.0 MGD would likely be in a better situation to understand and prepare for the application process, whereas owners of facilities below 5.0 MGD (smaller localities or authorities) will require more DEQ outreach, assistance and lead time to prepare preliminary engineering analyses and the information required in those analyses, and in determining the appropriate criteria compliance schedules. Similarly, the second tier should be increased from 0.1 MGD to 0.5 MGD, and the third tier from less than 0.1 MGD to less than 0.5 MGD.
DEQ's Response – The ammonia criteria amendments that will be recommended to the State Water Control Board for adoption include the PIP. In response to the comments received, staff has proposed changes to the classes of permittees outlined in Part G.1 and extended the effective dates of the criteria by 6 months for each of the three tiers.

e. Urge DEQ to use all available implementation procedures and practices to minimize the impacts on wastewater facilities, including procedures from other states that have been previously approved by EPA and other recommendations by VAMWA that are not prohibited by federal statute or regulation and reduce layers of conservatism in the permitting process.
DEQ's Response – DEQ is evaluating the factors and assumptions used in deriving ammonia permit limits and will make changes that can be reasonably accommodated and scientifically justified in order to provide additional relief to permittees. These changes will not be included in the Water Quality Standards Regulation, but will be addressed in agency permitting guidance with an opportunity for input from interested stakeholders.

2. Commenter: Town of Keysville; stated that compliance with more stringent ammonia criteria is too expensive and they cannot afford to do any plant improvements to increase ammonia removal. They understand the intent of the proposed regulation; however, the increased cost to already struggling budgets to small utilities such as theirs is neither fair nor feasible.
DEQ's Response - The proposed amendments provide the option of utilizing compliance schedules specific to ammonia that can extend longer than 5 years. Language was developed

with input from Regulatory Advisory Panel participants to amend section 9VAC25-260-155 (ammonia criteria) to address permit compliance schedules for ammonia limits to allow for the time necessary to secure financial resources for facility upgrades needed for those facilities to be compliant with newer, more stringent discharge limits. Any additional modification to permitting practices for determination of discharge limits for ammonia would be addressed through permitting guidance. On the issue of potential financial stress caused by implementing the revised ammonia criteria, the 2018 General Assembly revised the eligibility provisions of the Water Quality Improvement Fund to specifically identify "cost effective technologies to reduce loads of…nitrogen-containing ammonia" to the list of project types eligible for grant funding. Further, DEQ's Clean Water Revolving Loan Fund Program makes available low interest loans for plant retrofits, sometimes with zero-interest (and on occasion "principal forgiveness") in cases of severe fiscal stress on the recipient.

3. Commenter: VA Manufacturers Association; stated that the factors for demonstrating the need for an extended compliance schedule do not adequately account for industrial dischargers. DEQ should include a specific process for industrial dischargers to assert and receive protection against the public disclosure of confidential business information. The time frame for issuing permits incorporating the new criteria (as water quality-based effluent limits) is too inflexible. Request that DEQ revise 9 VAC 25-260-155.G.3.a, to add the following factor ("v"): "For industrial dischargers, the technological or economic practicability of complying with the ammonia criteria, based on industry or facility-specific information".

   DEQ's Response - DEQ acknowledges that the language included in State Code and the proposed Regulation applies more directly to municipal facilities. DEQ has modified Parts G.3.a.i., G.3.b.ii, and G.3.b.iv to clarify that these provisions are also available to industrial discharges.

   The intent of the proposed PIP is that it be applicable to all VPDES permits issued pursuant to 9VAC25-31, Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation. While both major and minor industrial facilities are referenced in the PIP, DEQ agrees that some clarifying revisions (underlined below) should be made to the proposal to better accommodate industrial dischargers.

   - *Item 3.a.i. will now read: "The relative priority of ammonia criteria and other water quality and water infrastructure needs of the local community or permittee". (This change could cover any non-municipal treatment plant, such as industrials, privately-owned treatment works, or commercial facilities).*
   - *Item 3.b.iii. will now read: "An assessment of projected affordability and identification of all potential sources of funding for enhanced ammonia treatment. In the case of publicly owned treatment works, include an evaluation of the required sewer use fee versus median household income".*

   Under provisions of the state statute governing Freedom of Information, DEQ cannot give assurance that confidential business information provided by an industrial applicant for the PIP will be protected against public disclosure. While the State Water Control Law (§62.1-44.21. Information to be furnished to Board) and VPDES Permit Regulation (9VAC25-31-80 and -860. Confidentiality of Information) appear to provide some protection for "secret formulae, processes, or methods" claimed as confidential, DEQ is unsure this would apply to the PIP, as "Information required by VPDES application forms provided by the department may not be claimed confidential". Therefore, it is recommended that this type of information should not be included with the application.

In response to the comments received, to provide more flexibility in the time frame for issuing permits incorporating the new criteria, staff has proposed changes to the classes of permittees outlined in Part G.1 and extended the effective dates of the criteria by 6 months for each of the three tiers. The phased effective date schedule in Part G.1 applies to permits being reissued and does not prompt permit modifications to incorporate the new ammonia water quality criteria. Staff has not added VMA's proposed paragraph G.3.a.v., as it extends authority beyond that identified in the state code.

4. Commenter: Appalachian Power Co.; APCo uses ammonia and related chemical compounds in various water treatment and air pollution control capacities. The list of components of an extended compliance schedule demonstration in proposed language 9VAC25-260-155.G.3.b may not be inclusive of all potential components of such a demonstration. Requests that the language in 9VAC25-260-155-G.3.b.ii and iv be modified to provide flexibility to permittees for whom source reduction may be the most favorable strategy and provide time to select the appropriate alternative compliance mechanism.
   DEQ's Response - The intent of the proposed phased implementation plan is that it be applicable to all VPDES permits issued pursuant to 9VAC25-31, Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation. Staff has proposed changes to 9VAC25-260-155.G.3.b.ii and iv to recognize source reduction alternatives for industries.
5. Commenter: U.S. Environmental Protection Agency; Consider using a different term in the compliance schedule context or, at a minimum, clarify: (1) what the term "highest achievable condition (HAC)" means with respect to compliance schedules; and, (2) that its use here does not imply that an applicant for a compliance schedule is also applying for, or obtaining, a water quality standards variance. Work with EPA so they may understand what the state intends with this proposal and to identify options to achieve the state's intended outcome. The compliance schedule language in the PIP is not subject to EPA water quality standards review under Clean Water Act Section 303(c); however, they constitute NPDES program revisions subject to EPA review under Section 402.
   DEQ's Response - Proposed section 9VAC25-260-155.G.3.b(v) states: "An evaluation, prepared by a professional engineer registered in Virginia, of the highest achievable condition (HAC) regarding nitrification capabilities of the current treatment facility design under the influent loading conditions expected during the term of the VPDES permit and the design loading conditions." DEQ believes it is apparent the term "highest achievable condition" refers to wastewater within the facility and subsequent quality of effluent and not the highest achievable condition of instream water quality of the receiving stream.
   EPA has been a participant in the Regulatory Advisory Panel during the development of this Phased Implementation Program and throughout the promulgation of ammonia criteria amendments and DEQ will continue to work with, and seek input from EPA as this issue progresses.
   DEQ acknowledges EPA's finding that the PIP language is not subject to WQS review under CWA Section 303(c), but will be subject to EPA review as an element of Virginia's VPDES Permit Program under CWA Section 402.

   Regarding EPA's prior comment (dated 11/6/17; submitted during the first public review period) on inclusion of the 4-day average chronic criterion, DEQ has revised the proposal to add the following text. This appears before each section for derivation of the chronic criteria, covering the three possible combinations for mussels and early life stages present or absent: "In addition,

the 4-day average concentration of total ammonia nitrogen (in mg N/L) shall not exceed 2.5 times the chronic criterion within a 30-day period, more than once every three years on the average."

While inclusion of the 4-day average chronic criterion is a change since the amendments were proposed for public comment, research done by DEQ staff indicate that it is not a significant change in terms of impact on permitted dischargers or potential for additional assessments of state waters as "impaired" due to failure to meet the criterion. Regarding the potential impact on permitted dischargers, in accordance with EPA's guidance, if the ammonia chronic criteria are implemented using the 30Q10 stream flow, then no further conditions are necessary. Implementation of the 30-day chronic criteria at 30Q10 is protective of the 4-day average chronic criteria; therefore, no additional impact on VPDES permittees is anticipated due to inclusion of the 4-day average criteria in the proposal.

The results from a statistical analysis of ambient monitoring data strongly suggests that in the majority of free-flowing streams in the Commonwealth, attainment of the 4-day average ammonia criterion can be presumed when the 30-day average criterion is met. Site-specific variability of ammonia was determined from datasets spanning multiple years generated in 20 streams across the state. Using the variability determined for each stream, 200 simulated annual datasets were created. These datasets were then used to estimate the likelihood that a given waterbody would exceed the 4-day average criterion while meeting the 30-day average criterion. This analysis found that the variability of ammonia in 75% of the examined waterbodies is so low that there is a negligible risk of the 4-day mean criterion being exceeded when the 30-day mean criterion is met. The statewide percentage is likely much higher than 75%, since the streams that were selected for this analysis had been targeted for intensive monitoring because upstream sources elevate their risk of experiencing degraded water quality.

6. Commenter: Chesapeake Bay Foundation; Recommend language be included to define a specific number of permit cycles and suggest that the limit be two 5-year permit cycles or an applicable TMDL deadline for the tributary to which the facility discharges, whichever is earliest. Expand grant funding to include low interest financing programs such as Virginia's Clean Water Revolving Loan Program. Explore opportunities to incentivize additional total nitrogen reductions, which may coincide with upgrades needed for achieving ammonia criteria but are not required.

   DEQ's Response - The controlling requirement for the schedule under the PIP will be that "compliance shall be achieved as soon as possible in accordance with 9 VAC 25-31-250.A.1". Regarding grant funding, DEQ cannot unilaterally expand availability because of dependence on General Assembly appropriations to the Water Quality Improvement Fund (WQIF) and any restrictions put on the use of those funds in budget language. However, the 2018 General Assembly revised the eligibility provisions of the WQIF to specifically identify "cost effective technologies to reduce loads of…nitrogen-containing ammonia" to the list of project types eligible for grant funding. Further, DEQ's Clean Water Revolving Loan Fund Program does make available low interest loans for plant retrofits, sometimes with zero-interest (and on occasion "principal forgiveness") in cases of severe fiscal stress on the recipient.

   DEQ acknowledges the recommendation to explore additional incentives for nitrogen reductions to coincide with upgrades needed to achieve ammonia criteria. As stated above, any financial incentives are dependent on General Assembly appropriations to the WQIF or other funds and any restrictions put on the use of those funds in budget language.

Regulatory Text [Changes since proposed shown in brackets]

9VAC25-260-155. Ammonia surface water quality criteria.

A. The Department of Environmental Quality, after consultation with the Virginia Department of Game and Inland Fisheries and the U.S. Fish and Wildlife Service, has determined that the majority of Virginia freshwaters are likely to contain, or have contained in the past, freshwater mussel species in the family Unionidae and contain early life stages of fish during most times of the year. Therefore, the ammonia criteria presented in subsections B and C of this section are designed to provide protection to these species and life stages. In an instance where it can be adequately demonstrated that either freshwater mussels or early life stages of fish are not present in a specific waterbody, potential options for alternate, site-specific criteria are presented in subsection D of this section. Acute criteria are a one-hour average concentration not to be exceeded more than once every three years[1] on the average, and chronic criteria are 30-day average concentrations not to be exceeded more than once every three years on the average.[2] [In addition, the 4-day average concentration of total ammonia nitrogen (in mg N/L) shall not exceed 2.5 times the chronic criterion within a 30-day period, more than once every three years on the average.]

B. The ~~one-hour average concentration of total ammonia nitrogen (in mg N/L) in freshwater shall not exceed, more than once every three years on the average[1], the~~ acute criteria for total ammonia (in mg N/L) for freshwaters with trout absent or present are below:

~~Acute Ammonia Freshwater Criteria~~
~~Total Ammonia Nitrogen (mg N/L)~~

~~pH~~	~~Trout Present~~	~~Trout Absent~~
~~6.5~~	~~32.6~~	~~48.8~~
~~6.6~~	~~31.3~~	~~46.8~~
~~6.7~~	~~29.8~~	~~44.6~~
~~6.8~~	~~28.1~~	~~42.0~~
~~6.9~~	~~26.2~~	~~39.1~~
~~7.0~~	~~24.1~~	~~36.1~~
~~7.1~~	~~22.0~~	~~32.8~~
~~7.2~~	~~19.7~~	~~29.5~~
~~7.3~~	~~17.5~~	~~26.2~~
~~7.4~~	~~15.4~~	~~23.0~~
~~7.5~~	~~13.3~~	~~19.9~~
~~7.6~~	~~11.4~~	~~17.0~~
~~7.7~~	~~9.65~~	~~14.4~~
~~7.8~~	~~8.11~~	~~12.1~~
~~7.9~~	~~6.77~~	~~10.1~~

~~8.0~~	~~5.62~~	~~8.40~~
~~8.1~~	~~4.64~~	~~6.95~~
~~8.2~~	~~3.83~~	~~5.72~~
~~8.3~~	~~3.15~~	~~4.71~~
~~8.4~~	~~2.59~~	~~3.88~~
~~8.5~~	~~2.14~~	~~3.20~~
~~8.6~~	~~1.77~~	~~2.65~~
~~8.7~~	~~1.47~~	~~2.20~~
~~8.8~~	~~1.23~~	~~1.84~~
~~8.9~~	~~1.04~~	~~1.56~~
~~9.0~~	~~0.885~~	~~1.32~~

Acute Ammonia Freshwater Criteria
Total Ammonia Nitrogen (mg N/L)
TROUT ABSENT

	Temperature (°C)																				
pH	0-10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	51	48	44	41	37	34	32	29	27	25	23	21	19	18	16	15	14	13	12	11	9.9
6.6	49	46	42	39	36	33	30	28	26	24	22	20	18	17	16	14	13	12	11	10	9.5
6.7	46	44	40	37	34	31	29	27	24	22	21	19	18	16	15	14	13	12	11	9.8	9.0
6.8	44	41	38	35	32	30	27	25	23	21	20	18	17	15	14	13	12	11	10	9.2	8.5
6.9	41	38	35	32	30	28	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9
7.0	38	35	33	30	28	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9	7.3
7.1	34	32	30	27	25	23	21	20	18	17	15	14	13	12	11	10	9.3	8.5	7.9	7.2	6.7
7.2	31	29	27	25	23	21	19	18	16	15	14	13	12	11	9.8	9.1	8.3	7.7	7.1	6.5	6.0
7.3	27	26	24	22	20	18	17	16	14	13	12	11	10	9.5	8.7	8.0	7.4	6.8	6.3	5.8	5.3

7.4	24	22	21	19	18	16	15	14	13	12	11	9.8	9.0	8.3	7.7	7.0	6.5	6.0	5.5	5.1	4.7
7.5	21	19	18	17	15	14	13	12	11	10	9.2	8.5	7.8	7.2	6.6	6.1	5.6	5.2	4.8	4.4	4.0
7.6	18	17	15	14	13	12	11	10	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5
7.7	15	14	13	12	11	10	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5	3.2	2.9
7.8	13	12	11	10	9.3	8.5	7.9	7.2	6.7	6.1	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.2	2.9	2.7	2.5
7.9	11	9.9	9.1	8.4	7.7	7.1	6.6	3.0	5.6	5.1	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1
8.0	8.8	8.2	7.6	7.0	6.4	5.9	5.4	5.0	4.6	4.2	3.9	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.7
8.1	7.2	6.8	6.3	5.8	5.3	4.9	4.5	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4
8.2	6.0	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2
8.3	4.9	4.6	4.3	3.9	3.6	3.3	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.96
8.4	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79
8.5	3.3	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	0.98	0.90	0.83	0.77	0.71	0.65

8.6	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.5	1.3	1.2	1.1	1.0	0.96	0.88	0.81	0.75	0.69	0.63	0.58	0.54
8.7	2.3	2.2	2.0	1.8	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.94	0.87	0.80	0.74	0.68	0.62	0.57	0.53	0.49	0.45
8.8	1.9	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37
8.9	1.6	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.85	0.79	0.72	0.67	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.32
9.0	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37	0.34	0.32	0.29	0.27

Acute Ammonia Freshwater Criteria Total Ammonia Nitrogen (mg N/L) TROUT PRESENT																	
Temperature (°C)																	
pH	0-14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
6.5	33	33	32	29	27	25	23	21	19	18	16	15	14	13	12	11	9.9
6.6	31	31	30	28	26	24	22	20	18	17	16	14	13	12	11	10	9.5
6.7	30	30	29	27	24	22	21	19	18	16	15	14	13	12	11	9.8	9.0
6.8	28	28	27	25	23	21	20	18	17	15	14	13	12	11	10	9.2	8.5

6.9	26	26	25	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	7.9
7.0	24	24	23	21	20	18	17	15	14	13	12	11	10	9.4	8.6	8.0	7.3
7.1	22	22	21	20	18	17	15	14	13	12	11	10	9.3	8.5	7.9	7.2	6.7
7.2	20	20	19	18	16	15	14	13	12	11	9.8	9.1	8.3	7.7	7.1	6.5	6.0
7.3	18	18	17	16	14	13	12	11	10	9.5	8.7	8.0	7.4	6.8	6.3	5.8	5.3
7.4	15	15	15	14	13	12	11	9.8	9.0	8.3	7.7	7.0	6.5	6.0	5.5	5.1	4.7
7.5	13	13	13	12	11	10	9.2	8.5	7.8	7.2	6.6	6.1	5.6	5.2	4.8	4.4	4.0
7.6	11	11	11	10	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5
7.7	9.6	9.6	9.3	8.6	7.9	7.3	6.7	6.2	5.7	5.2	4.8	4.4	4.1	3.8	3.5	3.2	3.0
7.8	8.1	8.1	7.9	7.2	6.7	6.1	5.6	5.2	4.8	4.4	4.0	3.7	3.4	3.2	2.9	2.7	2.5
7.9	6.8	6.8	6.6	6.0	5.6	5.1	4.7	4.3	4.0	3.7	3.4	3.1	2.9	2.6	2.4	2.2	2.1
8.0	5.6	5.6	5.4	5.0	4.6	4.2	3.9	3.6	3.3	3.0	2.8	2.6	2.4	2.2	2.0	1.9	1.7
8.1	4.6	4.6	4.5	4.1	3.8	3.5	3.2	3.0	2.7	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4
8.2	3.8	3.8	3.7	3.5	3.1	2.9	2.7	2.4	2.3	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2
8.3	3.1	3.1	3.1	2.8	2.6	2.4	2.2	2.0	1.9	1.7	1.6	1.4	1.3	1.2	1.1	1.0	0.96
8.4	2.6	2.6	2.5	2.3	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.2	1.1	1.0	0.93	0.86	0.79
8.5	2.1	2.1	2.1	1.9	1.8	1.6	1.5	1.4	1.3	1.2	1.1	0.98	0.90	0.83	0.77	0.71	0.65
8.6	1.8	1.8	1.7	1.6	1.5	1.3	1.2	1.1	1.0	0.96	0.88	0.81	0.75	0.69	0.63	0.59	0.54
8.7	1.5	1.5	1.4	1.3	1.2	1.1	1.0	0.94	0.87	0.80	0.74	0.68	0.62	0.57	0.53	0.49	0.45
8.8	1.2	1.2	1.2	1.1	1.0	0.93	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37
8.9	1.0	1.0	1.0	0.93	0.85	0.79	0.72	0.67	0.61	0.56	0.52	0.48	0.44	0.40	0.37	0.34	0.32
9.0	0.88	0.88	0.86	0.79	0.73	0.67	0.62	0.57	0.52	0.48	0.44	0.41	0.37	0.34	0.32	0.29	0.27

The acute criteria for trout present shall apply to all Class V-Stockable Trout Waters and Class VI-Natural Trout Waters as listed in 9VAC25-260-390 through 9VAC25-260-540. The acute criteria for trout absent apply to all other fresh waters.

To calculate total ammonia nitrogen acute criteria values in freshwater at different pH values than those listed in this subsection, use the following ~~formulas~~ equations and round the result to two significant digits:

Where trout are ~~present~~ absent:

Acute Criterion Concentration (mg N/L) =

~~0.275~~	~~+~~	~~39.0~~
~~$(1 + 10^{7.204\text{-pH}})$~~		~~$(1 + 10^{\text{pH-}7.204})$~~

$$0.7249 \text{ X } \left(\frac{0.0114}{1 + 10^{7.204\text{-pH}}} + \frac{1.6181}{1 + 10^{\text{pH-}7.204}} \right) \text{ X MIN}$$

Where MIN = 51.93 or $23.12 \text{ X } 10^{0.036 \text{ X } (20 - T)}$, whichever is less

T = Temperature in ºC

Or where trout are ~~absent~~ present, whichever of the below calculation results is less:

Acute Criterion Concentration (mg N/L) =

$$\frac{0.411}{(1 + 10^{7.204\text{-pH}})} + \frac{58.4}{(1 + 10^{\text{pH-}7.204})}$$

[1]~~The default design flow for calculating steady state waste load allocations for the acute ammonia criterion is the 1Q10 (see 9VAC25-260-140 B footnote 10) unless statistically valid methods are employed which demonstrate compliance with the duration and return frequency of the water quality criteria.~~

$$\left(\frac{0.275}{1 + 10^{7.204\text{-pH}}} + \frac{39.0}{1 + 10^{\text{pH-}7.204}} \right)$$

or

$$0.7249 \text{ X } \left(\frac{0.0114}{1 + 10^{7.204\text{-pH}}} + \frac{1.6181}{1 + 10^{\text{pH-}7.204}} \right) \text{ X } (23.12 \text{ X } 10^{0.036\text{X}(20 - T)})$$

T = Temperature in ºC

~~B.~~ C. The ~~30-day average concentration of~~ chronic criteria for total ammonia nitrogen (in mg N/L) where freshwater mussels and early life stages of fish are present in freshwater ~~shall not exceed, more than once every three years on the average[2], the chronic criteria~~ are below:

~~Chronic Ammonia Freshwater Criteria~~
~~Early Life Stages of Fish Present~~
~~Total Ammonia Nitrogen (mg N/L)~~

	~~Temperature (°C)~~									
~~pH~~	~~0~~	~~14~~	~~16~~	~~18~~	~~20~~	~~22~~	~~24~~	~~26~~	~~28~~	~~30~~
~~6.5~~	~~6.67~~	~~6.67~~	~~6.06~~	~~5.33~~	~~4.68~~	~~4.12~~	~~3.62~~	~~3.18~~	~~2.80~~	~~2.46~~
~~6.6~~	~~6.57~~	~~6.57~~	~~5.97~~	~~5.25~~	~~4.61~~	~~4.05~~	~~3.56~~	~~3.13~~	~~2.75~~	~~2.42~~
~~6.7~~	~~6.44~~	~~6.44~~	~~5.86~~	~~5.15~~	~~4.52~~	~~3.98~~	~~3.50~~	~~3.07~~	~~2.70~~	~~2.37~~
~~6.8~~	~~6.29~~	~~6.29~~	~~5.72~~	~~5.03~~	~~4.42~~	~~3.89~~	~~3.42~~	~~3.00~~	~~2.64~~	~~2.32~~
~~6.9~~	~~6.12~~	~~6.12~~	~~5.56~~	~~4.89~~	~~4.30~~	~~3.78~~	~~3.32~~	~~2.92~~	~~2.57~~	~~2.25~~

7.0	5.91	5.91	5.37	4.72	4.15	3.65	3.21	2.82	2.48	2.18
7.1	5.67	5.67	5.15	4.53	3.98	3.50	3.08	2.70	2.38	2.09
7.2	5.39	5.39	4.90	4.31	3.78	3.33	2.92	2.57	2.26	1.99
7.3	5.08	5.08	4.61	4.06	3.57	3.13	2.76	2.42	2.13	1.87
7.4	4.73	4.73	4.30	3.78	3.32	2.92	2.57	2.26	1.98	1.74
7.5	4.36	4.36	3.97	3.49	3.06	2.69	2.37	2.08	1.83	1.61
7.6	3.98	3.98	3.61	3.18	2.79	2.45	2.16	1.90	1.67	1.47
7.7	3.58	3.58	3.25	2.86	2.51	2.21	1.94	1.71	1.50	1.32
7.8	3.18	3.18	2.89	2.54	2.23	1.96	1.73	1.52	1.33	1.17
7.9	2.80	2.80	2.54	2.24	1.96	1.73	1.52	1.33	1.17	1.03
8.0	2.43	2.43	2.21	1.94	1.71	1.50	1.32	1.16	1.02	0.897
8.1	2.10	2.10	1.91	1.68	1.47	1.29	1.14	1.00	0.879	0.773
8.2	1.79	1.79	1.63	1.43	1.26	1.11	0.973	0.855	0.752	0.661
8.3	1.52	1.52	1.39	1.22	1.07	0.941	0.827	0.727	0.639	0.562
8.4	1.29	1.29	1.17	1.03	0.906	0.796	0.700	0.615	0.541	0.475
8.5	1.09	1.09	0.990	0.870	0.765	0.672	0.591	0.520	0.457	0.401
8.6	0.920	0.920	0.836	0.735	0.646	0.568	0.499	0.439	0.386	0.339
8.7	0.778	0.778	0.707	0.622	0.547	0.480	0.422	0.371	0.326	0.287
8.8	0.661	0.661	0.601	0.528	0.464	0.408	0.359	0.315	0.277	0.244
8.9	0.565	0.565	0.513	0.451	0.397	0.349	0.306	0.269	0.237	0.208
9.0	0.486	0.486	0.442	0.389	0.342	0.300	0.264	0.232	0.204	0.179

Chronic Ammonia Freshwater Criteria
Mussels and Early Life Stages of Fish Present
Total Ammonia Nitrogen (mg N/L)

	Temperature (°C)																					
pH	0-7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28
6.5	4.9	4.6	4.3	4.1	3.8	3.6	3.3	3.1	2.9	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.6	1.5	1.5	1.4	1.3
6.6	4.8	4.5	4.3	4.0	3.8	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3
6.7	4.8	4.5	4.2	3.9	3.7	3.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
6.8	4.6	4.4	4.1	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2
6.9	4.5	4.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2
7.0	4.4	4.1	3.8	3.6	3.4	3.2	3.0	2.8	2.6	2.4	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1
7.1	4.2	3.9	3.7	3.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1
7.2	4.0	3.7	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0
7.3	3.8	3.5	3.3	3.1	2.9	2.7	2.6	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	0.97

7.4	3.5	3.3	3.1	2.9	2.7	2.5	2.4	2.2	2.1	2.0	1.8	1.7	1.6	1.5	1.4	1.3	1.3	1.2	1.1	1.0	0.96	0.90	
7.5	3.2	3.0	2.8	2.7	2.5	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.83	
7.6	2.9	2.8	2.6	2.4	2.3	2.1	2.0	1.9	1.8	1.6	1.5	1.4	1.4	1.3	1.2	1.1	1.1	0.98	0.92	0.86	0.81	0.76	
7.7	2.6	2.4	2.3	2.2	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.94	0.88	0.83	0.78	0.73	0.68	
7.8	2.3	2.2	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	
7.9	2.1	1.9	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.2	1.1	1.0	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	
8.0	1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	1.1	1.0	0.94	0.88	0.83	0.78	0.73	0.68	0.64	0.60	0.56	0.53	0.50	0.44	
8.1	1.5	1.5	1.4	1.3	1.2	1.1	1.1	0.99	0.92	0.87	0.81	0.76	0.71	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	
8.2	1.3	1.2	1.2	1.1	1.0	0.96	0.90	0.84	0.79	0.74	0.70	0.65	0.61	0.57	0.54	0.50	0.47	0.44	0.42	0.39	0.37	0.34	
8.3	1.1	1.1	0.99	0.93	0.87	0.82	0.76	0.72	0.67	0.63	0.59	0.55	0.52	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	

8.4	0.95	0.89	0.84	0.79	0.74	0.69	0.65	0.61	0.57	0.53	0.50	0.47	0.44	0.41	0.39	0.36	0.34	0.32	0.30	0.28	0.26	0.25	0
8.5	0.80	0.75	0.71	0.67	0.62	0.58	0.55	0.51	0.48	0.45	0.42	0.40	0.37	0.35	0.33	0.31	0.29	0.27	0.25	0.24	0.22	0.21	0
8.6	0.68	0.64	0.60	0.56	0.53	0.49	0.46	0.43	0.41	0.38	0.36	0.33	0.31	0.29	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0
8.7	0.57	0.54	0.51	0.47	0.44	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0
8.8	0.49	0.46	0.43	0.40	0.38	0.35	0.33	0.31	0.29	0.27	0.26	0.24	0.23	0.21	0.20	0.19	0.17	0.16	0.15	0.14	0.13	0.13	0
8.9	0.42	0.39	0.37	0.34	0.32	0.30	0.28	0.27	0.25	0.23	0.22	0.21	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.12	0.11	0
9.0	0.36	0.34	0.32	0.30	0.28	0.26	0.24	0.23	0.21	0.20	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.11	0.10	0.09	0

To calculate total ammonia nitrogen chronic criteria values in freshwater when ~~fish~~ freshwater mussels and early life stages of fish are present at different pH and temperature values than those listed in this subsection, use the following ~~formulas~~ equation and round the result to two significant digits:

Chronic Criteria Concentration =

~~($\frac{0.0577}{(1 + 10^{7.688 - pH})}$ + $\frac{2.487}{(1 + 10^{pH - 7.688})}$) x MIN~~

~~Where MIN = 2.85 or 1.45 x $10^{0.028(25 - T)}$, whichever is less.~~

$$0.8876 \text{ X } \left(\frac{0.0278}{1 + 10^{7.688\text{-pH}}} + \frac{1.1994}{1 + 10^{\text{pH}-7.688}} \right) \text{ X } \left(2.126 \text{ X } 10^{0.028 \text{ X } (20 - \text{MAX}(T,7))}\right)$$

Where MAX = 7 or temperature in degrees Celsius, whichever is greater

T = temperature in °C

~~[2]The default design flow for calculating steady state waste load allocations for the chronic ammonia criterion where early life stages of fish are present is the 30Q10 (see 9VAC25-260-140 B footnote 10) unless statistically valid methods are employed which demonstrate compliance with the duration and return frequency of the water quality criteria.~~

D. Site-specific considerations and alternate criteria. If it can be adequately demonstrated that freshwater mussels or early life stages of fish are not present at a site, then alternate site-specific criteria can be considered using the information provided in this subsection. Recalculated site-specific criteria shall provide for the attainment and maintenance of the water quality standards of downstream waters.

1. Site-specific modifications to the ambient water quality criteria for ammonia to account for the absence of freshwater mussels or early life stages of fish shall be conducted in accordance with the procedures contained in this subdivision. Because the department presumes that most state waterbodies have freshwater mussels and early life stages of fish present during most times of the year, the criteria shall be calculated assuming freshwater mussels and early life stages of fish are present using subsections B and C of this section unless the following demonstration that freshwater mussels or early life stages of fish are absent is successfully completed. Determination of the absence of freshwater mussels requires special field survey methods. This determination must be made after an adequate survey of the waterbody is conducted by an individual certified by the Virginia Department of Game and Inland Fisheries (DGIF) for freshwater mussel identification and surveys. Determination of absence of freshwater mussels will be done in consultation with the DGIF. Early life stages of fish are defined in subdivision 2 of this subsection. Modifications to the ambient water quality criteria for ammonia based on the presence or absence of early life stages of fish shall only apply at temperatures below 15°C.

a. During the review of any new or existing activity that has a potential to discharge ammonia in amounts that may cause or contribute to a violation of the ammonia criteria contained in subsection B of this section, the department may examine data from the following approved sources in subdivisions 1 a (1) through (5) of this subsection or may require the gathering of data in accordance with subdivisions 1 a (1) through (5) on the presence or absence of early life stages of fish in the affected waterbody.

(1) Species and distribution data contained in the Virginia Department of Game and Inland Fisheries Wildlife Information System database.

(2) Species and distribution data contained in Freshwater Fishes of Virginia, 1994.

(3) Data and fish species distribution maps contained in Handbook for Fishery Biology, Volume 3, 1997.

(4) Field data collected in accordance with U.S. EPA's Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers, Second Edition, EPA 841-B-99-002. Field data must comply with all quality assurance and quality control criteria.

(5) The American Society for Testing and Materials (ASTM) Standard E-1241-88, Standard Guide for Conducting Early Life-Stage Toxicity Tests with Fishes.

b. If data or information from sources other than subdivisions 1 a (1) through (5) of this subsection are considered, then any resulting site-specific criteria modifications shall be reviewed and adopted in accordance with the site-specific criteria provisions in 9VAC25-260-140 D and submitted to EPA for review and approval.

c. If the department determines that the data and information obtained from subdivisions 1 a (1) through (5) of this subsection demonstrate that there are periods of each year when no early life stages are expected to be present for any species of fish that occur at the site, the department shall issue a notice to the public and make available for public comment the supporting data and analysis along with the department's preliminary decision to authorize the site-specific modification to the ammonia criteria. Such information shall include, at a minimum:

(1) Sources of data and information.

(2) List of fish species that occur at the site as defined in subdivision 3 of this subsection.

(3) Definition of the site. Definition of a "site" can vary in geographic size from a stream segment to a watershed to an entire eco-region.

(4) Duration of early life stage for each species in subdivision 1 c (2) of this subsection.

(5) Dates when early life stages of fish are expected to be present for each species in subdivision 1 c (2) of this subsection.

(6) Based on subdivision 1 c (5) of this subsection, identify the dates (beginning date, ending date), if any, where no early life stages are expected to be present for any of the species identified in subdivision 1 c (2) of this subsection.

d. If, after reviewing the public comments received in subdivision 1 c of this subsection and supporting data and information, the department determines that there are times of the year when no early life stages are expected to be present for any fish species that occur at the site, then the applicable ambient water quality criteria for ammonia for those time periods shall be calculated using the table in this subsection, or the formula for calculating the chronic criterion concentration for ammonia when early life stages of fish are absent.

e. The department shall maintain a comprehensive list of all sites where the department has determined that early life stages of fish are absent. For each site the list will identify the waterbodies affected and the corresponding times of the year that early life stages of fish are absent. This list is available either upon request from the Office of Water Quality Programs at [~~629~~][1111] East Main Street, [Suite 1400,] Richmond, VA 23219, or from the department website at http://www.deq.virginia.gov/programs/water/waterqualityinformationtmdls/waterqualitystandards.aspx.

2. The duration of the "early life stages" extends from the beginning of spawning through the end of the early life stages. The early life stages include the prehatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically similar to adults, are not considered an early life stage. The duration of early life stages can vary according to fish species. The department considers the sources of information in subdivisions 1 a (1) through (5) of this subsection to be the only acceptable sources of information for determining the duration of early life stages of fish under this procedure.

3. "Occur at the site" includes the species, genera, families, orders, classes, and phyla that are usually present at the site; are present at the site only seasonally due to migration; are present intermittently

because they periodically return to or extend their ranges into the site; or were present at the site in the past or are present in nearby bodies of water, but are not currently present at the site due to degraded conditions, and are expected to return to the site when conditions improve. "Occur at the site" does not include taxa that were once present at the site but cannot exist at the site now due to permanent physical alteration of the habitat at the site.

4. Any modifications to ambient water quality criteria for ammonia in subdivision 1 of this subsection shall not likely jeopardize the continued existence of any federal or state listed, threatened, or endangered species or result in the destruction or adverse modification of such species' critical habitats.

5. Site-specific modifications to the ambient water quality criteria for ammonia to account for the absence of freshwater mussels shall be conducted in accordance with the procedures contained in this subsection. Because the department presumes that most state waterbodies have freshwater mussel species, the criteria shall be calculated assuming mussels are present using subsections B and C of this section unless the demonstration that freshwater mussels are absent is successfully completed and accepted by DEQ and DGIF.

6. Equations for calculating ammonia criteria for four different site-specific scenarios are provided in subdivisions a through d of this subdivision 6 as follows: (i) acute criteria when mussels are absent but trout are present, (ii) acute criteria when mussels and trout are absent, (iii) chronic criteria when mussels are absent and early life stages of fish are present, and (iv) chronic criteria when mussels and early life stages of fish are absent. Additional information regarding site-specific criteria can be reviewed in appendix N (pages 225-242) of the EPA Aquatic Life Ambient Water Quality Criteria to Ammonia--Freshwater 2013 (EPA 822-R-13-001).

a. Acute criteria: freshwater mussels absent and trout present. To calculate total ammonia nitrogen acute criteria values (in mg N/L) in freshwater with freshwater mussels absent (procedures for making this determination are in subdivisions 1 through 5 of this subsection) and trout present, use the following equations. The acute criterion is the lesser of the calculation results below. Round the result to two significant digits.

$$\left(\frac{0.275}{1 + 10^{7.204-pH}} \pm \frac{39}{1 + 10^{pH-7.204}} \right)$$

or

$$0.7249 \text{ X } \left(\frac{0.0114}{1 + 10^{7.204-pH}} \pm \frac{1.6181}{1 + 10^{pH-7.204}} \right) \text{ X } \left(62.15 \text{ X } 10^{0.036X(20 - T)}\right)$$

b. Acute criteria: freshwater mussels absent and trout absent. To calculate total ammonia nitrogen acute criteria values (in mg N/L) in freshwater where freshwater mussels are absent and trout are absent, use the following equation. Round the result to two significant digits.

$$0.7249 \text{ X } \left(\frac{0.0114}{1 + 10^{7.204-pH}} \pm \frac{1.6181}{1 + 10^{pH-7.204}} \right) \text{ X MIN}$$

Where MIN = 51.93 or $62.15 \text{ X } 10^{0.036 \text{ X } (20 - T)}$, whichever is less

T = Temperature in ^{o}C

~~C. The 30-day average concentration of~~ c. Chronic criteria: freshwater mussels absent and early life stages of fish present. The chronic criteria for total ammonia nitrogen (in mg N/L) where ~~early life stages of fish~~ freshwater mussels are absent (procedures for making this determination are in subdivisions 1 through 4 5 of this subsection) in freshwater shall not exceed~~, more than once every three years on the average[3], the chronic criteria below:~~ concentration values calculated using the following equation. Round the result to two significant digits.

~~Chronic Ammonia Freshwater Criteria~~
~~Early Life Stages of Fish Absent~~
~~Total Ammonia Nitrogen (mg N/L)~~

	Temperature (°C)									
pH	0-7	8	9	10	11	12	13	14	15	16
6.5	10.8	10.1	9.51	8.92	8.36	7.84	7.35	6.89	6.46	6.06
6.6	10.7	9.99	9.37	8.79	8.24	7.72	7.24	6.79	6.36	5.97
6.7	10.5	9.81	9.20	8.62	8.08	7.58	7.11	6.66	6.25	5.86
6.8	10.2	9.58	8.98	8.42	7.90	7.40	6.94	6.51	6.10	5.72
6.9	9.93	9.31	8.73	8.19	7.68	7.20	6.75	6.33	5.93	5.56
7.0	9.60	9.00	8.43	7.91	7.41	6.95	6.52	6.11	5.73	5.37
7.1	9.20	8.63	8.09	7.58	7.11	6.67	6.25	5.86	5.49	5.15
7.2	8.75	8.20	7.69	7.21	6.76	6.34	5.94	5.57	5.22	4.90
7.3	8.24	7.73	7.25	6.79	6.37	5.97	5.60	5.25	4.92	4.61
7.4	7.69	7.21	6.76	6.33	5.94	5.57	5.22	4.89	4.59	4.30
7.5	7.09	6.64	6.23	5.84	5.48	5.13	4.81	4.51	4.23	3.97
7.6	6.46	6.05	5.67	5.32	4.99	4.68	4.38	4.11	3.85	3.61
7.7	5.81	5.45	5.11	4.79	4.49	4.21	3.95	3.70	3.47	3.25
7.8	5.17	4.84	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89
7.9	4.54	4.26	3.99	3.74	3.51	3.29	3.09	2.89	2.71	2.54
8.0	3.95	3.70	3.47	3.26	3.05	2.86	2.68	2.52	2.36	2.21
8.1	3.41	3.19	2.99	2.81	2.63	2.47	2.31	2.17	2.03	1.91
8.2	2.91	2.73	2.56	2.40	2.25	2.11	1.98	1.85	1.74	1.63
8.3	2.47	2.32	2.18	2.04	1.91	1.79	1.68	1.58	1.48	1.39
8.4	2.09	1.96	1.84	1.73	1.62	1.52	1.42	1.33	1.25	1.17
8.5	1.77	1.66	1.55	1.46	1.37	1.28	1.20	1.13	1.06	0.990
8.6	1.49	1.40	1.31	1.23	1.15	1.08	1.01	0.951	0.892	0.836
8.7	1.26	1.18	1.11	1.04	0.976	0.915	0.858	0.805	0.754	0.707
8.8	1.07	1.01	0.944	0.885	0.829	0.778	0.729	0.684	0.641	0.601
8.9	0.917	0.860	0.806	0.756	0.709	0.664	0.623	0.584	0.548	0.513
9.0	0.790	0.740	0.694	0.651	0.610	0.572	0.536	0.503	0.471	0.442

At 15°C and above, the criterion for fish early life stages absent is the same as the criterion for fish early life stages present.

To calculate total ammonia nitrogen chronic criteria values in freshwater when fish early life stages are absent at different pH and temperature values than those listed in this subsection, use the following formulas:

Chronic Criteria Concentration =

$$\left(\frac{0.0577}{(1 + 10^{7.688-pH})} + \frac{2.487}{(1 + 10^{pH-7.688})} \right) \times 1.45(10^{0.028(25-MAX)})$$

MAX = temperature in °C or 7, whichever is greater.

[3]The default design flow for calculating steady state waste load allocations for the chronic ammonia criterion where early life stages of fish are absent is the 30Q10 (see 9VAC25-260-140 B footnote 10) unless statistically valid methods are employed that demonstrate compliance with the duration and return frequency of the water quality criteria.

1. Site-specific modifications to the ambient water quality criteria for ammonia to account for the absence of early life stages of fish shall be conducted in accordance with the procedures contained in this subdivision. Because the department presumes that most state waterbodies have early life stages of fish present during most times of the year, the criteria shall be calculated assuming early life stages of fish are present using subsection B of this section unless the following demonstration that early life stages are absent is successfully completed. Early life stages of fish are defined in subdivision 2 of this subsection. Modifications to the ambient water quality criteria for ammonia based on the presence or absence of early life stages of fish shall only apply at temperatures below 15°C.

a. During the review of any new or existing activity that has a potential to discharge ammonia in amounts that may cause or contribute to a violation of the ammonia criteria contained in subsection B of this section, the department may examine data from the following approved sources in subdivisions 1 a (1) through (5) of this subsection or may require the gathering of data in accordance with subdivisions 1 a (1) through (5) on the presence or absence of early life stages of fish in the affected waterbody.

(1) Species and distribution data contained in the Virginia Department of Game and Inland Fisheries Wildlife Information System database.

(2) Species and distribution data contained in Freshwater Fishes of Virginia, 1994.

(3) Data and fish species distribution maps contained in Handbook for Fishery Biology, Volume 3, 1997.

(4) Field data collected in accordance with U.S. EPA's Rapid Bioassessment Protocols for Use in Streams and Wadeable Rivers, Second Edition, EPA 841-B-99-002. Field data must comply with all quality assurance/quality control criteria.

(5) The American Society for Testing and Materials (ASTM) Standard E-1241-88, Standard Guide for Conducting Early Life-Stage Toxicity Tests with Fishes.

b. If data or information from sources other than subdivisions 1 a (1) through (5) of this subsection are considered, then any resulting site-specific criteria modifications shall be reviewed and adopted in accordance with the site-specific criteria provisions in 9VAC25-260-140 D, and submitted to EPA for review and approval.

c. If the department determines that the data and information obtained from subdivisions 1 a (1) through (5) of this subsection demonstrate that there are periods of each year when no early life stages are expected to be present for any species of fish that occur at the site, the department shall issue a notice to the public and make available for public comment the supporting data and analysis along with the department's preliminary decision to authorize the site-specific modification to the ammonia criteria. Such information shall include, at a minimum:

(1) Sources of data and information.

(2) List of fish species that occur at the site as defined by subdivision 3 of this subsection.

(3) Definition of the site. Definition of a "site" can vary in geographic size from a stream segment to a watershed to an entire eco-region.

(4) Duration of early life stage for each species in subdivision 1 c (2) of this subsection.

(5) Dates when early life stages of fish are expected to be present for each species in subdivision 1 c (2) of this subsection.

~~(6) Based on subdivision 1 c (5) of this subsection, identify the dates (beginning date, ending date), if any, where no early life stages are expected to be present for any of the species identified in subdivision 1 c (2) of this subsection.~~

~~d. If, after reviewing the public comments received in subdivision 1 c of this subsection and supporting data and information, the department determines that there are times of the year where no early life stages are expected to be present for any fish species that occur at the site, then the applicable ambient water quality criteria for ammonia for those time periods shall be calculated using the table in this subsection, or the formula for calculating the chronic criterion concentration for ammonia when fish early life stages are absent.~~

~~e. The department shall maintain a comprehensive list of all sites where the department has determined that early life stages of fish are absent. For each site the list will identify the waterbodies affected and the corresponding times of the year that early life stages are absent. This list is available either upon request from the Office of Water Quality Programs at P.O. Box 1105, Richmond, Virginia 23218 or from the department website http://www.deq.virginia.gov/wqs.~~

~~2. The duration of the "early life stages" extends from the beginning of spawning through the end of the early life stages. The early life stages include the prehatch embryonic period, the post-hatch free embryo or yolk-sac fry, and the larval period, during which the organism feeds. Juvenile fish, which are anatomically similar to adults, are not considered an early life stage. The duration of early life stages can vary according to fish species. The department considers the sources of information in subdivisions 1 a (1) through (5) of this subsection to be the only acceptable sources of information for determining the duration of early life stages of fish under this procedure.~~

~~3. "Occur at the site" includes the species, genera, families, orders, classes, and phyla that: are usually present at the site; are present at the site only seasonally due to migration; are present intermittently because they periodically return to or extend their ranges into the site; were present at the site in the past or are present in nearby bodies of water, but are not currently present at the site due to degraded conditions, and are expected to return to the site when conditions improve. "Occur at the site" does not include taxa that were once present at the site but cannot exist at the site now due to permanent physical alteration of the habitat at the site.~~

~~4. Any modifications to ambient water quality criteria for ammonia in subdivision 1 of this subsection shall not likely jeopardize the continued existence of any federal or state listed, threatened or endangered species or result in the destruction or adverse modification of such species' critical habitat.~~

$$0.9405 \times \left(\frac{0.0278}{1 + 10^{7.688-pH}} + \frac{1.1994}{1 + 10^{pH-7.688}} \right) \times MIN$$

Where $MIN = 6.920$ or $7.547 \times 10^{0.028 \times (20 - T)}$ whichever is less

T = temperature in °C

d. Chronic criteria: freshwater mussels absent and early life stages of fish absent. The chronic criteria for total ammonia nitrogen (in mg N/L) where freshwater mussels are absent and early life stages of fish are absent (procedures for making this determination are in subdivisions 1 through 5 of this subsection) in freshwater shall not exceed concentration values calculated using the following equation. Round the result to two significant digits.

$$0.9405 \times \left(\frac{0.0278}{1 + 10^{7.688-pH}} + \frac{1.1994}{1 + 10^{pH-7.688}} \right) \times (7.547 \times 10^{0.028 \times (20 - MAX(T,7))})$$

Where MAX = 7 or temperature in degrees Celsius, whichever is greater

T = temperature in °C

~~D.~~ E. The one-hour average concentration of total ammonia nitrogen (in mg N/L) in saltwater shall not exceed, more than once every three years on the average, the acute criteria below:

Acute Ammonia Saltwater Criteria
Total Ammonia Nitrogen (mg N/L)
Salinity = 10 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35
7.00	231.9	159.8	110.1	75.88	52.31	36.08	24.91	17.21
7.20	146.4	100.9	69.54	47.95	33.08	22.84	15.79	10.93
7.40	92.45	63.73	43.94	30.32	20.94	14.48	10.03	6.97
7.60	58.40	40.28	27.80	19.20	13.28	9.21	6.40	4.47
7.80	36.92	25.48	17.61	12.19	8.45	5.88	4.11	2.89
8.00	23.37	16.15	11.18	7.76	5.40	3.78	2.66	1.89
8.20	14.81	10.26	7.13	4.97	3.48	2.46	1.75	1.27
8.40	9.42	6.54	4.57	3.20	2.27	1.62	1.18	0.87
8.60	6.01	4.20	2.95	2.09	1.50	1.09	0.81	0.62
8.80	3.86	2.72	1.93	1.39	1.02	0.76	0.58	0.46
9.00	2.51	1.79	1.29	0.95	0.71	0.55	0.44	0.36

Salinity = 20 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35
7.00	247.6	170.5	117.5	80.98	55.83	38.51	26.58	18.36
7.20	156.3	107.7	74.21	51.17	35.30	24.37	16.84	11.66
7.40	98.67	68.01	46.90	32.35	22.34	15.44	10.70	7.43
7.60	62.33	42.98	29.66	20.48	14.17	9.82	6.82	4.76
7.80	39.40	27.19	18.78	13.00	9.01	6.26	4.37	3.07
8.00	24.93	17.23	11.92	8.27	5.76	4.02	2.83	2.01
8.20	15.80	10.94	7.59	5.29	3.70	2.61	1.86	1.34
8.40	10.04	6.97	4.86	3.41	2.41	1.72	1.24	0.91

8.60	6.41	4.47	3.14	2.22	1.59	1.15	0.85	0.65
8.80	4.11	2.89	2.05	1.47	1.07	0.80	0.61	0.48
9.00	2.67	1.90	1.36	1.00	0.75	0.57	0.46	0.37

Salinity = 30 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35
7.00	264.6	182.3	125.6	86.55	59.66	41.15	28.39	19.61
7.20	167.0	115.1	79.31	54.68	37.71	26.03	17.99	12.45
7.40	105.5	72.68	50.11	34.57	23.87	16.50	11.42	7.92
7.60	66.61	45.93	31.69	21.88	15.13	10.48	7.28	5.07
7.80	42.10	29.05	20.07	13.88	9.62	6.68	4.66	3.27
8.00	26.63	18.40	12.73	8.83	6.14	4.29	3.01	2.13
8.20	16.88	11.68	8.10	5.64	3.94	2.78	1.97	1.42
8.40	10.72	7.44	5.18	3.63	2.56	1.82	1.31	0.96
8.60	6.83	4.77	3.34	2.36	1.69	1.22	0.90	0.68
8.80	4.38	3.08	2.18	1.56	1.13	0.84	0.64	0.50
9.00	2.84	2.01	1.45	1.06	0.79	0.60	0.47	0.39

To calculate total ammonia nitrogen acute criteria values in saltwater at different pH and temperature values than those listed in this subsection, use the following formulas:

$$I = \frac{19.9273S}{(1000 - 1.005109S)}$$

Where I = molal ionic strength of water

S = Salinity ppt (g/kg)

The regression model used to relate I to pKa (negative log of the ionization constant) is

pKa = 9.245 + 0.138(I)

pKa as defined by these equations is at 298 degrees Kelvin (25°C). T °Kelvin = °C + 273

To correct for other temperatures:

$pKa^{S}_{T} = pKa^{S}_{298} + 0.0324(298 - T\ °Kelvin)$

The unionized ammonia fraction (UIA) is given by:

$$UIA = \frac{1}{1 + 10(pKa^{S}_{T}-pH)}$$

The acute ammonia criterion in saltwater is given by:

$$Acute = \frac{0.233}{UIA}$$

Multiply the acute value by 0.822 to get the ammonia-N acute criterion.

~~E.~~ F. The 30-day average concentration of total ammonia nitrogen (in mg N/L) in saltwater shall not exceed, more than once every three years on the average, the chronic criteria below:

Chronic Ammonia Saltwater Criteria
Total Ammonia Nitrogen (mg N/L)
Salinity = 10 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35
7.00	34.84	24.00	16.54	11.40	7.86	5.42	3.74	2.59
7.20	21.99	15.15	10.45	7.20	4.97	3.43	2.37	1.64
7.40	13.89	9.57	6.60	4.55	3.15	2.18	1.51	1.05
7.60	8.77	6.05	4.18	2.88	2.00	1.38	0.96	0.67
7.80	5.55	3.83	2.65	1.83	1.27	0.88	0.62	0.43
8.00	3.51	2.43	1.68	1.17	0.81	0.57	0.40	0.28
8.20	2.23	1.54	1.07	0.75	0.52	0.37	0.26	0.19
8.40	1.41	0.98	0.69	0.48	0.34	0.24	0.18	0.13
8.60	0.90	0.63	0.44	0.31	0.23	0.16	0.12	0.09
8.80	0.58	0.41	0.29	0.21	0.15	0.11	0.09	0.07
9.00	0.38	0.27	0.19	0.14	0.11	0.08	0.07	0.05

Salinity = 20 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35
7.00	37.19	25.62	17.65	12.16	8.39	5.78	3.99	2.76
7.20	23.47	16.17	11.15	7.69	5.30	3.66	2.53	1.75
7.40	14.82	10.22	7.04	4.86	3.36	2.32	1.61	1.12
7.60	9.36	6.46	4.46	3.08	2.13	1.47	1.02	0.71
7.80	5.92	4.08	2.82	1.95	1.35	0.94	0.66	0.46
8.00	3.74	2.59	1.79	1.24	0.86	0.60	0.43	0.30
8.20	2.37	1.64	1.14	0.79	0.56	0.39	0.28	0.20
8.40	1.51	1.05	0.73	0.51	0.36	0.26	0.19	0.14
8.60	0.96	0.67	0.47	0.33	0.24	0.17	0.13	0.10
8.80	0.62	0.43	0.31	0.22	0.16	0.12	0.09	0.07
9.00	0.40	0.28	0.20	0.15	0.11	0.09	0.07	0.06

Salinity = 30 g/kg

	Temperature °C							
pH	0	5	10	15	20	25	30	35

7.00	39.75	27.38	18.87	13.00	8.96	6.18	4.27	2.95
7.20	25.09	17.29	11.91	8.21	5.67	3.91	2.70	1.87
7.40	15.84	10.92	7.53	5.19	3.59	2.48	1.72	1.19
7.60	10.01	6.90	4.76	3.29	2.27	1.57	1.09	0.76
7.80	6.32	4.36	3.01	2.08	1.44	1.00	0.70	0.49
8.00	4.00	2.76	1.91	1.33	0.92	0.64	0.45	0.32
8.20	2.53	1.75	1.22	0.85	0.59	0.42	0.30	0.21
8.40	1.61	1.12	0.78	0.55	0.38	0.27	0.20	0.14
8.60	1.03	0.72	0.50	0.35	0.25	0.18	0.14	0.10
8.80	0.66	0.46	0.33	0.23	0.17	0.13	0.10	0.08
9.00	0.43	0.30	0.22	0.16	0.12	0.09	0.07	0.06

To calculate total ammonia nitrogen chronic criteria values in saltwater at different pH and temperature values than those listed in this subsection, use the following formulas:

$$I = \frac{19.9273S}{(1000 - 1.005109S)}$$

Where I = molal ionic strength of water

S = Salinity ppt (g/kg)

The regression model used to relate I to pKa (negative log of the ionization constant) is

pKa = 9.245 + 0.138(I)

pKa as defined by these equations is at 298 degrees Kelvin (25°C). T °Kelvin = °C + 273

To correct for other temperatures:

$pKa^{S}_{T} = pKa^{S}_{298} + 0.0324(298 - T\ °Kelvin)$

The unionized ammonia fraction (UIA) is given by:

$$UIA = \frac{1}{1 + 10(pKa^{S}_{T}-pH)}$$

The chronic ammonia criterion in saltwater is given by:

$$Chronic = \frac{0.035}{UIA}$$

Multiply the chronic value by 0.822 to get the ammonia-N chronic criterion.

[1]The default design flow for calculating steady state wasteload allocations for the acute ammonia criterion for freshwater is the 1Q10 (see 9VAC25-260-140 B footnote [~~10~~][6]) unless statistically valid methods are employed which demonstrate compliance with the duration and return frequency of the water quality criteria.

[2]The default design flow for calculating steady state wasteload allocations for the chronic ammonia criterion for freshwater is the 30Q10 (see 9VAC25-260-140 B footnote [~~10~~][6]) unless statistically valid methods are employed which demonstrate compliance with the duration and return frequency of the water quality criteria.

G. [~~Implementation of ammonia criteria through Virginia Pollutant Discharge Elimination System (VPDES) Permits. The ammonia criteria in subsections A, B, and C of this section shall be addressed during individual VPDES permit reissuance for existing dischargers subject to new or more restrictive water quality-based ammonia effluent limits in accordance with the department's standard permitting practices except as follows:~~

~~1. Notwithstanding any other regulatory requirement, a compliance schedule may be established that exceeds the term of the permit, subject to a demonstration by the permittee that a longer period is necessary to allow a reasonable opportunity to attain compliance with the new or more restrictive ammonia discharge requirements. The department's consideration for such a demonstration shall be made on a case-by-case basis and shall require compliance as soon as possible, but not later than the applicable statutory deadline under the Clean Water Act.~~

~~2. Information to be provided under subdivision 1 of this subsection may include such factors as (i) opportunities to minimize costs to the public or facility owners by phasing in the implementation of multiple projects, (ii) time needed for freshwater mussel habitat determinations, and (iii) other relevant factors.~~

~~3. If a permit establishes a schedule of compliance that exceeds the term of the permit, the compliance schedule shall set forth interim requirements and the dates for their achievement.~~

~~a. The time between interim dates shall not exceed one year.~~

~~b. If the time necessary for completion of any interim requirement is more than one year and is not readily divisible into stages for completion, the permit shall specify interim dates for the submission of reports of progress toward completion of the interim requirements and indicate a projected completion date.~~

~~c. The permit shall be written to require that no later than 14 days following each interim date and the final date of compliance, the permittee shall notify the department in writing of its compliance or noncompliance with the interim or final requirements, or submit progress reports if subdivision 3 b of this subsection is applicable.~~

~~d. Any change to an interim compliance date in the schedule of compliance will be deemed to be a minor modification of the permit, provided the new date is not more than 120 days after the date specified in the existing permit and does not interfere with attainment of the final compliance date requirement.~~]

[Implementation of Freshwater Ammonia Criteria in subsections B and C through VPDES Permits issued pursuant to 9VAC25-31 - Virginia Pollutant Discharge Elimination System (VPDES) Permit Regulation.

1. The above criteria in subsections B and C shall be implemented in VPDES permits that are being reissued in accordance with the following schedule:

   a. Major municipal with design flows greater than or equal to 5 million gallons per day and major industrial facilities – **12 months following the WQS effective date**
   b. Municipal facilities with design flows greater than or equal to 500,000 gallons per day and less than 5 million gallons per day and all minor industrial facilities – **24 months following the WQS effective date**.
   c. Minor municipal facilities with design flows that are less than 500,000 gallons per day – **36 months following the WQS effective date.**

2. VPDES permits shall not be revoked and reissued to avoid or delay being subject to the freshwater ammonia criteria in subsections B and C in accordance with the above schedule.

3. The provisions of 9 VAC 25-31-250.A.3 notwithstanding, a permittee may request and the board may authorize, as appropriate, an extended schedule of compliance, which exceeds the term of the VPDES

permit and may include multiple permit cycles to achieve effluent limits based on the freshwater ammonia water quality criteria in subsections B and C.

a. Any extended schedule of compliance necessary for the implementation of the freshwater ammonia criteria shall require compliance as soon as possible in accordance with 9 VAC 25-31-250.A.1. The board may consider the following factors on a case-by-case basis, relying on information provided by the permittee, in making a determination of "as soon as possible":

   i. The relative priority of ammonia criteria and other water quality and water infrastructure needs of the local community or permittee.
   ii. Availability of grant funding pursuant to VA Code § 10.1-2131 and other treatment facility expansion and upgrade plans,
   iii. Whether an extended schedule of compliance is appropriate for facilities or classes of facilities, and
   iv. Appropriate mechanisms to address affordability limitations and financial hardship situations remaining notwithstanding parts i through iii above.

b. Any request by the permittee for an extended schedule of compliance shall include at the time of permit application the following information at a minimum:
   i. Documentation of other water quality and water infrastructure projects that are in the planning, design or construction process and the relative priority of the projects in relation to compliance with the ammonia criteria.
   ii. A preliminary engineering analysis of treatment facility upgrade or source reduction alternatives necessary to meet the freshwater ammonia criteria. The analysis may include any additional upgrade or expansion plans currently under consideration. The analysis shall be prepared by a professional engineer registered in Virginia and shall include an estimation of the capital and operations and maintenance costs.
   iii. An assessment of project affordability and identification of all potential sources of funding for enhanced ammonia treatment. In the case of publicly owned treatment works, include an evaluation of the required sewer use fees versus median household income.
   iv. Documentation that demonstrates the minimum estimated time required and schedule to design, fund and construct the selected treatment or source reduction alternative.
   v. An evaluation, prepared by a professional engineer registered in Virginia, of the highest achievable condition (HAC) regarding nitrification capabilities of the existing treatment facility under the influent loading conditions expected during the term of the VPDES permit as well as under design loading conditions.

c. Any VPDES permit that authorizes an extended schedule of compliance for meeting the freshwater ammonia criteria that exceeds the permit term shall include interim effluent limitations based on the HAC attainable during the term of the permit, final effluent limitations and a final compliance date.

d. New dischargers defined in 9VAC25-31 are not eligible for extended schedules of compliance under this section; however, they remain eligible for schedules of compliance consistent with

9VAC25-31-250.

A permittee may seek a site-specific modification or variance to the freshwater ammonia water quality criteria under 9VAC25-260-140.D, or 9VAC25-260-140.E as applicable.]

Approval of two TMDL reports and amendment of the Water Quality Management Planning regulation to include the corresponding TMDL wasteload allocations: Staff will ask the Board to (1) approve portions of two TMDL reports and (2) adopt the corresponding amendments to Virginia's Water Quality Management Planning regulation. As of July 1, 2014, TMDL waste load allocations receive State Water Control Board approval prior to EPA approval due to amendments outlined in §2.2-4006.A.14 of the Code of Virginia. The TMDL reports have been reviewed by EPA for required TMDL elements; however, they remain in draft form until State Water Control Board approval.

1. Approval of two TMDL reports, Amendment of Water Quality Management Planning regulation to incorporate seven new WLAs

1. The report titled, *"Total Maximum Daily Load for Bacteria and a Proactive Approach for Dissolved Oxygen Impairment for Rudee Inlet, Virginia Beach, Virginia"* proposes bacteria reductions for the Rudee Inlet watershed and provides a bacteria waste load allocations of 2.20E+13 counts/year. The report also proposes a proactive approach to address the dissolved oxygen impairment on Owl Creek in the Rudee Inlet watershed. Therefore, no waste load allocation is provided.
2. The report titled, *"PCB Total Maximum Daily Load Development for Reed Creek the Upper New River, Peak Creek, Walker Creek, Stony Creek, and the Lower New River"* proposes PCB TMDLs for the Reed Creek, Upper New River, Peak Creek, Walker Creek, Stony Creek, and Lower New River watersheds and provides PCB waste load allocations of 2,548.2 mg/year, 1,616.5 mg/year, 345 mg/year, 13.6 mg/year, 7,601.9 mg/year, and 38,868 mg/year, respectively.

The specific portions of the TMDL report to be approved include the TMDL itself and all the TMDL allocation components, the pollutant reduction scenarios, implementation strategies, reasonable assurance that the TMDL can be implemented, and a summary of the public participation process. The TMDL reports were developed in accordance with Federal Regulations (40 CFR §130.7). The TMDL reports were subject to the public participation process contained in §2.2-4006.A.14 of the Code of Virginia and DEQ's "Public Participation Procedures for Water Quality Management Planning" that the Board approved in September 2014. Written comments provided by stakeholders as well as the Commonwealth's responses are submitted to EPA together with the TMDL report. TMDL reports are also made available to the public on DEQ's web site under http://www.deq.virginia.gov/Programs/Water/WaterQualityInformationTMDLs/TMDL/TMDLDevelopment/DraftTMDLReports.aspx.

2. Adoption of seven new wasteload allocations. The process for amending the Water Quality Management Planning regulation is specified in §2.2-4006A.14 and §2.2-4006B of the Code of Virginia. The amendments consist of adding seven new WLAs that are included in the TMDL reports reviewed by EPA. Staff will therefore propose that the Board, in accordance with §2.2-4006A.14 and §2.2-4006B of the Code of Virginia, adopt the amendments to the Water Quality Management Planning regulation. The TMDL WLAs were published in the Virginia Register (Volume 35, Issue 3) on October 1, 2018, with a public comment period ending on October 31, 2018. Staff received no comments.

Report On Facilities In Significant Noncompliance: One new permittee was reported to EPA on the Quarterly Noncompliance Report as being in significant noncompliance (SNC) for the quarter ending June 30, 2018. The permittee, the facility and the reported instances of noncompliance are as follows:

Permittee/Facility: **City of Franklin/Franklin WWTP**

Type of Noncompliance:	**Failure to Meet Permit Effluent Limits (Total Phosphorus, Ammonia as Nitrogen)**
City/County	Franklin, Virginia
Receiving Water:	Blackwater River
Impaired Water:	The Blackwater River is listed as impaired for aquatic life, fish consumption, and recreation uses. The causes of the aquatic life impairment are water temperature, dissolved oxygen, and benthic-macroinvertebrate bioassessments. The cause of the fish consumption impairment is mercury in fish tissue, and the cause of the recreation impairment is Escherichia coli.
River Basin:	Chowan and Dismal Swamp River Basin
Dates of Noncompliance:	February, April, and May 2018
Requirements Contained In:	VPDES Permit
DEQ Region:	Tidewater Regional Office

The City attributed the violations to various operator errors and mechanical failures, including a broken diffuser, a leaking pressure relief valve on an aeration blower, leaking air seals, and issues with the drive system of one of the trains. To address these issues, the City made several equipment repairs, conducted solids handling training for operators, and consulted with a process engineer. The City returned to compliance for ammonia in June but experienced violations of its zinc permit effluent limit in June and its total phosphorus permit effluent limit in September. DEQ's Tidewater Regional Office has issued two Notices of Violation to the City and anticipates entering into a consent order with the City to address the violations.

Piedmont Neighborhoods, LP, Whittington Subdivision - Albemarle County - Consent Order w/ Civil Penalty: Piedmont Neighborhoods, LP (Responsible Party) is developing a housing subdivision in Albemarle County at the Intersection of Old Lynchburg Road and Singleton Lane, the second and third phases of a residential development to include 79 residential lots and associated infrastructure, known as "Whittington Phases B and C" (Property). On January 15, 2015, DEQ issued Virginia Water Protection Permit No. WP4-14-1750 (Permit) to the Responsible Party and Notices of Planned Change (NOPC) were approved on March 17, 2016 and June 24, 2018, for designated impacts to streams and wetlands at the Property. This permit authorizes permanent impacts to 237 linear feet of stream channel and 0.03 acre of palustrine forested wetland, and temporary impacts to 95 linear feet of stream channel. "Whittington Phase A" is authorized under VWP General Permit No. WP4-13-1363 and includes the permanent impact of 54 linear feet of stream channel and temporary impacts to 181 linear feet of stream channel. Compensatory mitigation is not required because the cumulative permitted permanent impacts are less than the thresholds specified in 9 VAC 25-690-50(A)(2)(a). A site inspection was conducted on March 17, 2017, and DEQ staff observed 2,400 linear feet of unauthorized, measurable sedimentation in the unnamed tributary to Biscuit Run and 0.01 acre of palustrine emergent wetland impacted by sedimentation from the construction activities. On March 31, 2017, DEQ issued Notice of Violation (NOV) No. 1703-000285 to the Responsible Party for violations of 9 VAC 25-210-50(A), 62.1-44.15:20(A), and Permit Part I(C)(2), (C)(10), and (C)(11). In April of 2017, DEQ staff met with Responsible Party representatives, and their consultant to discuss the inspection observations and the NOV. As a result, the Responsible Party submitted a Corrective Action Plan (CAP), detailing activities towards restoration and a specific schedule for its return to compliance. The Responsible Party submitted bi-weekly inspection reports for the Property on May 11, 2017, May 25, 2017, June 6, 2017, and June 20, 2017, to demonstrate progress with the CAP. On April 5, 2018, DEQ staff inspected the Site for compliance with the Permit and submitted CAP. DEQ staff observed approximately 1,500 linear feet of new, unpermitted stream channel impacts to the unnamed tributaries to Biscuit Run, associated with sedimentation from the Site. Additionally, the CAP indicated that the stream channel impact at Impact Area 2 was 124 linear feet. The permitted stream channel impact for Impact Area 2 is 76 linear feet. The Responsible Party did not submit Notice of Planned Change (NOPC) for the additional, permanent stream impacts. At the time of the inspection of the Property, DEQ had not received

the NOPC for this activity. On May 23, 2018, DEQ issued NOV No. 1805-000737 to the Responsible Party for the violations of 9 VAC 25-210-50(A), 62.1-44.15:20(A), and Permit Part A (2) that were observed on April 5, 2018. The Responsible Party submitted documentation to DEQ on June 16, 2018 to demonstrate its return to compliance with the Permit requirements and associated regulations. This documentation detailed hand removal, with photo documentation and included the submittal of a NOPC. Civil Charge: $61,285.

FY 2019 Virginia Clean Water Revolving Loan Fund Final Authorizations: Title IV of the Clean Water Act requires the annual submission of a Project Priority List and Intended Use Plan in conjunction with Virginia's Clean Water Revolving Loan Fund Capitalization Grant application. Section 62.1-229 of Chapter 22, Code of Virginia, authorizes the Board to establish to whom loans are made, the loan amounts, and repayment terms. The next step in this process is for the Board to set the loan terms and authorize the execution of the loan agreements. On June 1, 2018 Clean Water Financing and Assistance Program staff solicited applications from the Commonwealth's localities and wastewater authorities as well as potential land conservation, living shoreline, and Brownfield remediation applicants. July 20, 2018 was established as the deadline for receiving applications. Based on this solicitation, DEQ received applications for nine (9) wastewater improvement projects, two (2) living shoreline projects, and one (1) land conservation, with the amount requested totaling $100,975,323. By memorandum dated September 20, 2018, the Director of DEQ authorized staff to proceed to public comment for the 12 projects for which loan assistance was requested from available and anticipated FY 2019 resources. A public meeting was convened on November 7th. Notice of the meeting was posted on the Virginia Regulatory Town Hall and DEQ's Clean Water Financing and Assistance Program website. No comments were received.

The staff has conducted initial meetings with the FY 2019 targeted recipients and has finalized the recommended loan amounts, interest rates and loan terms in accordance with the Board's guidelines. No changes from the list previously approved by the DEQ Director are being recommended. The loan terms listed in the table below are submitted for Board consideration. In accordance with Board guidelines, a residential user charge impact analysis was conducted for each wastewater project. This analysis determines the anticipated user charges as a result of the project relative to the affordable rate as a percentage of the applicant's median household income. Projects involving higher user charges relative to income generally receive lower interest rates than those with relatively lower user charges.

Like the last two years, the ceiling rate subsidy for wastewater related projects differ depending on the term of the loan, such that 20-year ceiling loan rates are set at 1.5% (150 basis points) below market, 25-year ceiling loan rates are 1.25% (125 basis points) below market, and 30-year ceiling loan rates are 1% (100 basis points) below market. Market rates would be based on evaluation by Virginia Resource Authority (VRA) of the market conditions that exist about a month prior to each loan closing. For projects such as wastewater treatment plants and pump stations that involve significant mechanical equipment, the maximum loan term would be up to 25 years, whereas projects that primarily involve wastewater conveyance piping installation or improvements could be up to 30 years and no longer than the expected useful life of the project.

Congress has not finalized the federal State Revolving Fund appropriation for FY 2019. As such, we are unsure as to the amount, if any, that could be made available as principal forgiveness in FY 2019. The staff will analyze the projects with regard to the program's hardship affordability criteria and will be prepared to work with the Director on providing principal forgiveness to some projects as allowed by previous delegations if it is provided for by the federal appropriation.

FY 2019 Proposed Interest Rates and Loan Authorizations

Locality	*Loan Amount*	*Rates and Loan Terms*
City of Lynchburg	$1,500,000	0%, up to 20 years
City of Covington	$5,708,000	0%, up to 20 years
City of Norfolk	$10,000,000	0%, up to 20 years
Town of Tazewell	$10,656,046	0%, up to 25 years
Town of Honaker	$1,152,736	0%, up to 25 years
Harrisonburg/Rockingham RSA	$37,524,000	CR, up to 30 years
Lee County PSA	$1,156,300	0%, up to 25 years
Wise County PSA	$815,441	0%, up to 20 years
Alexandria Renew Enterprises	$9,400,000	CR, up to 25 years
The Nature Conservancy (land conservation)	$20,125,000	3%, up to 20 years
James City County (living shoreline)	$2,687,800	CR, up to 20 years
Middle Peninsula PDC (living shoreline)	$250,000	0%, up to 15 years
TOTAL	$100,975,323	CR = Ceiling Rate