



COMMONWEALTH of VIRGINIA

DEPARTMENT OF ENVIRONMENTAL QUALITY

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REGULATORY ADVISORY PANEL MEETING SUMMARY

Triennial Review - Water Quality Standards

December 13, 2013

Welcome and Introductions

Advisory Panel Members and Alternates Present:

City of Richmond: Grace LeRose

Dominion Power: Jason Ericson

Filtterra: Chris French

Friends of the Rivers of Virginia: Patti Jackson

Hampton Roads Planning District Commission: Jenny Tribo

Hampton Roads Sanitation District: Jamie Mitchell

James River Association: Jamie Brunkow

VA Association of Municipal Wastewater Agencies: Jamie Heisig-Mitchell

VA Farm Bureau Federation: Wilmer Stoneman

VA Manufacturer's Association/VA Mining Issues Group: Brooks Smith

US Environmental Protection Agency: Cheryl Atkinson

US Fish & Wildlife Service: Brett Hillman

VA Dept. Conservation & Recreation: Rene Hypes

VA Dept. Game & Inland Fisheries: Ernie Aschenbach

VA Dept. Health: Matt Skiljo

DEQ Staff Present:

John Kennedy (Facilitator), Alex Barron, David Whitehurst, Allan Brockenbrough, Arthur Butt, Craig Lott

Agency Identified Issues

Human Health Criteria

Panel members were informed of eight compounds for which there are human health criteria updates recommended due to Integrated Risk Information System (IRIS; toxicology data compiled by EPA) updates to either reference doses (RfD) or oral slope factors (Q1*). The updated criteria calculations represent the most current science available and result in

proposed criteria that provide protection for public water supply and fish/shellfish consumption uses.

The updates are for the RfD for non-carcinogenic toxic pollutants nitrobenzene and free cyanide and oral slope factors for the following carcinogens: Carbon Tetrachloride, Hexachloroethane, Methylene Chloride, Pentachlorophenol, Tetrachloroethylene, Trichloroethylene. The newly calculated criteria concentrations increased for some and became more stringent for others. It was asked if the State has the option to maintain the lower criteria concentrations. VA does have the option to maintain criteria lower than the nationally recommended criteria should those nationally recommended become less stringent. It was then asked if EPA issues criteria recommendation updates based upon recalculations due to changes to RfDs and/or oral slope factors. DEQ and EPA responded they will look into that and report back to the panel. A comparison of the existing and recalculated criteria is provided in the table below.

Chemical	Existing Criteria (µg/L) Public Water Supply	Updated Criteria (µg/L) Public Water Supply	Existing Criteria (µg/L) All Non-PWS Waters	Updated Criteria (µg/L) All Non-PWS Waters
Carbon Tetrachloride	2.3	4.3	16	30
Cyanide , free	140	4.2	16,000	480
Hexachloroethane	14	5.0	33	12
Methylene Chloride	46	170	5,900	22,000
Nitrobenzene	17	68	690	2,800
Pentachlorophenol	2.7	0.80	30	9.1
Tetrachloroethylene	6.9	130	33	620
Trichloroethylene	25	7.0	300	82

Issues Leftover from 2010 Triennial Review

Manganese (Mn):

Surface water manganese concentrations in VA often exceed the PWS criterion, which is expressed as total recoverable metal (50 mg/L). EPA had disapproved a previously Board-adopted amendment to express as dissolved. The current standard is a Safe Drinking Water Act Secondary Maximum Contaminant Level concentration related to finished drinking water to prevent unwanted staining of laundry. The panel was shown 2 slides of statewide distribution of Mn concentrations above and below the WQS criterion of 50 mg/L in an effort to illustrate the widespread nature and geographic pattern of exceedences. Probabilistic Monitoring site Mn data (which are randomly selected) and 20 years of averaged data from regular ambient monitoring sites exhibit similar patterns in exceedence distribution – relatively evenly distributed throughout parts of the state east of the Blue Ridge Mountains. This issue is of particular concern to dischargers in the Roanoke River basin because 60+

miles of the river is designated as Public Water Supply (PWS) which can result in discharge effluent limits to meet a criterion for a parameter that some view as unreasonable for a criterion that shows evidence of high water column concentrations that are likely a natural occurrence.

DEQ outlined two options to address the issue: criterion modification or criterion deletion. EPA brought up concerns with simply deleting the manganese criterion because of concerns about toxicity and human health. DEQ staff asked EPA to please provide any information they may have with regard to recent aquatic life toxicity and/or human health studies.

Dominion Power informed the panel they would like to share information they have gained through studies regarding Mn fate and transport in the Roanoke basin. Dominion has asked if Dr. Madeline Schreiber may present some of the findings from her portion of the study to the group at the January 16, 2014 RAP meeting. Dr. Schreiber is a professor in the Department of Geosciences at VA Tech. The panel agreed it could be informative and helpful to hear from Dr. Schreiber.

Lead (Pb):

Inclusion of EPA-recommended conversion factor in the criteria calculation to allow Pb criteria concentrations to be expressed as dissolved measurements instead of total recoverable as it is in the current VA WQS regulation. It has been determined by DEQ that use of the conversion factor is appropriate for use with VA's state-specific Pb aquatic life criteria for fresh- and saltwater. No substantive discussion occurred.

Cadmium (Cd):

VA is considering revising the old Cd criteria in freshwater based on recent criteria recalculation reports presented by US Geological Service (USGS). USGS added newer data to the EPA 2001 dataset. This newer data was used to adjust the hardness slope used in criteria calculation. The USGS review focused on Idaho species and the Final Acute Value (FAV) and criteria was lowered to protect the cutthroat trout which is not present in VA. VA's draft recalculated Cd criteria is based on the entire dataset developed by USGS (2010) with the exception of cutthroat trout. The FAV for VA was lowered to accommodate trout species that are present in the state.

EPA asked whether VA was planning on setting limits on the levels of hardness that can be used to calculate the criterion. DEQ responded that the metals criteria in VA have a limitation of between 25 and 400 on the hardness levels that can be used to adjust the metals' criteria. Most of the toxicity tests that are the basis for the slope of the hardness effect were conducted between a hardness level of 25 and 400. EPA has recommended not extrapolating beyond where the effect on toxicity had been observed. The new toxicity data for Cd includes some tests that indicate that the effect of hardness on the toxicity of Cd has been demonstrated as low as a hardness level of 10. Below is a comparison of current and draft recalculated criteria with criteria examples calculated with a Water Effect Ratio of 1 and hardness of 100.

Freshwater	
Acute	Chronic
3.9 <u>1.8</u> WER = 1 CaCO ₃ =100	1.1 <u>0.55</u> WER = 1 CaCO ₃ = 100

Swampwaters Reclassifications (Class VII):

The panel was informed there are 20 Natural Conditions reports with waters or waterbody segments currently identified in the WQS as Class III waters (free-flowing freshwaters) that will be proposed for reclassification to Class VII (swampwaters). Class VII waters are waters with low slope and low velocity flow. These waters tend to have naturally lower dissolved oxygen concentrations and pH. The group was informed that the reports are available for inspection at the DEQ Water Quality Standards ‘Rulemakings’ web page.

Proposed Amendments RE: Lakes/Reservoirs:

The panel was informed of new additions to the list of impoundments in Section 9VAC25-260-187 to which man-made lake and reservoir nutrient criteria apply. The impoundments are: Lake Orange, a DGIF-owned impoundment in Orange Co., and the Upper & Lower Powhatan Lakes in Powhatan Co. Both are DGIF-impoundments managed as warmwater fisheries. EPA asked if DEQ has a definition of ‘lakes’ in the WQS regulation. There are site-specific nutrient criteria for VA’s two natural lakes and separate criteria for man-made lakes that are specified in the WQS. The term ‘man-made lake or reservoir’ is defined in the WQS as, “a constructed impoundment” and ‘natural lake’ is defined as, “...an impoundment that is natural in origin”. There are two natural lakes in Virginia: Mountain Lake in Giles County and Lake Drummond located within the boundaries of Chesapeake and Suffolk in the Great Dismal Swamp.” The ‘lake list’ in section 187 constitutes the vast majority of reservoirs in the state where there is public access and there is fishing use. Small private ponds and storm water retention ponds are not intended to be regulated by these criteria.

Application of Lake pH Criteria:

DEQ staff explained that in a lake or impoundment, organic decomposition creates organic acids. When combined with relatively high CO₂ concentrations resulting from anaerobic decomposition, the CO₂ dissociates into carbonic acid. Minimal buffering capacity at the lake bottom results in acidic conditions. This situation is exacerbated if a lake or reservoir is thermally stratified due to a lack of mixing of the oxygenated upper layer with the anoxic lower layer. It has been suggested by DEQ regional biologists that WQS section 9VAC25-260-50 be amended so the pH criteria is applied to lakes/reservoirs in a fashion similar to that for dissolved oxygen which only applies in the epilimnion (upper layer) when stratification occurs. No substantial discussion occurred.

Wetlands Definition:

The panel was informed of a suggestion to include a definition of 'wetlands' in Section 9VAC25-260-5 which mirrors the definition in VA Water Protection Permit Program Regulation, 9VAC25-210-10: "Wetlands" are those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas." No substantial discussion occurred.

Clarification on Applicable D.O. Criteria in Chesapeake Bay and its Tidal Tributaries:

The panel was informed of a minor discrepancy that exists between Sections 9VAC25-260-50 (Numerical Criteria for D.O., pH and Maximum Temperature) and 9VAC25-260-185 (Chesapeake Bay nutrient criteria). Both sections contain differing criteria for dissolved oxygen for Chesapeake Bay waters. It is suggested that clarifying language needed to indicate D.O. criteria in Section 185 takes precedence.

Acrolein & Carbaryl:

There were some questions about the extent of use of the pesticide carbaryl (Sevin) in the state of Virginia. There was no answer available but this will be investigated. It was thought to be extensively used by the general public. There was no discussion regarding acrolein.

Biotic Ligand Model for Copper Criteria

There was some discussion about the copper BLM and a concern was raised that the BLM allocates all the binding capacity of carbon to copper and does not take into consideration competitive binding by other metals. DEQ will ask EPA to help address that question.

Bacteria Criteria:

EPA-acceptable criteria components (measures of magnitude, duration, and frequency) were briefly reviewed for the group. The new nationally recommended bacteria criteria utilize a Statistical Threshold Value (STV; a single 'grab' sample number) and a geometric mean calculated using all available data from a 30-day period. It is recommended by EPA that the geometric mean should be assessed as a 'not to be exceeded' and an allowable exceedance rate of 10% for all STV values for the assessment period. During discussion, concerns were expressed about the EPA recommendation that water quality standards should not establish any minimum number of samples within a 30 day period in order to calculate a geometric mean.

The RAP was presented with general findings of a mock assessment done by Maryland Dept. of the Environment that compared their current criteria (very similar to VA's) and EPA's 2012 recommended criteria. They found the 2012 criteria would result in approximately the same number of notifications. Public would be "exposed" to similar water quality since beaches would be open at nearly the same rate with either criterion. However, the increase in the number of impairments (mostly caused by a single daily excursion) would create a significant financial and workload burden (TMDLs) with no obvious public health benefit. They are concerned that a single sample within a 30 day period will be considered a geometric mean and this could result in waterbodies being incorrectly judged as impaired, when in fact they are not. One RAP member said that trying to treat a single sample value as

a mean was bad math, bad science, and bad policy. EPA said we need to make distinctions between the criteria and monitoring and assessment. DEQ and EPA will consult to try to come to a better understanding about this issue and determine if, in fact, it is EPA's intention to require use of a single sample result from a 30 day period to represent both the STV and geometric mean.

Ammonia Criteria:

EPA's criteria document provides for a recalculation procedure for site-specific criteria derivation (mussels absent). The new ammonia criteria was discussed briefly and DEQ, DGIF, and USFWS will meet prior to the next meeting of the RAP to discuss issues concerning distribution of Unionid mussels and DEQ will report to the RAP at the January meeting.

Site Specific Temperature Criteria – Special Standard 'hh':

Special standard 'hh' was discussed. DEQ, DGIF, and USFWS met on December 11th to discuss this issue. USFWS recommended the Roanoke River sections should have a maximum temperature of 28 degree Centigrade and Tinker Creek should have a maximum temperature of 26 degrees Centigrade. These are based on available data for these two waterbodies. The RAP was informed that all waters are covered by WQS sections 60 and 70 which impose a maximum rise above natural temperature of 3° C (1° C for natural trout waters) and a maximum hourly temperature change of 2°C (0.5°C for natural trout waters).

Issues Identified Through NOIRA Comments Received

Addition of Pollution Definition & General Narrative Suggested Amendments

There was discussion about the Shenandoah Riverkeeper's request during the NOIRA comment period to amend the VA WQS to include a definition for pollution that is the same as the Federal Clean Water Act, Sect. 502 definition. The Riverkeeper also requested the following related change in the general standard:

"State waters, including wetlands, shall be free protected from ~~substances attributable to sewage, industrial waste, or other waste in concentrations, amounts, or combinations~~ pollution which ~~contravenes~~ established standards or ~~interferes~~ directly or indirectly with designated uses of such water or which are inimical or harmful to human, animal, plant, or aquatic life."

Most of the RAP members were concerned that the Virginia Administrative Code had a definition of pollution and the WQS Regulation should not be at odds with that. Some RAP members thought the suggested language would be more limiting than the current language, but others considered it an expansion.

Selenium Criteria

There was some discussion about the selenium criteria and a request by the mining interests that this old criteria be updated. The recalculated selenium criteria adopted by Kentucky and the portions approved by EPA were recommended for consideration. The group was informed that Appalachian Mountain Advocates had just filed a lawsuit against EPA for their approval of Kentucky's freshwater aquatic life chronic criterion. The lawsuit alleges that the accepted selenium standard fails to comply with the Clean Water Act. There was some

concern expressed about EPA partial approval as well as the subsequent lawsuit. DEQ was advised to move cautiously on this issue until EPA has made some recommendations on a national level, possibly next year. The EPA Region 3 representative stated that EPA may soon be releasing updated criteria for public comment. DEQ will make the recalculated selenium criteria report for Virginia available on the DEQ Rulemakings website.

VA Stream Condition Index

The use of the Virginia Stream Condition Index (VASCI) was discussed, with a suggestion that the Water Quality Standards (WQS) Regulation specifically state that the VASCI not be used in permits, but only as a monitoring and assessment tool. DEQ staff stated that the VASCI is used as an assessment tool to assess the narrative general standard which requires that a balanced aquatic life community be protected. If the VASCI score is not met in a monitored water body, a detailed TMDL study is conducted and the significant stressor(s) are identified. The stressor is then targeted for needed controls. It was said that DMME is putting VASCI controls directly in permits. DEQ said the use of the VASCI as a monitoring and assessment tool is best described in the monitoring and assessment guidance, rather than in the WQS regulation. A RAP member stated that it could be dangerous to specifically state in the WQS that the VASCI is not to be used for permits and compliance determinations if a TMDL identifies a stressor as originating from point sources.

Bromide Criterion for Public Water Supply Waters

A request for a criterion for bromide was received from two public water suppliers. This criterion was requested in order for the public water supply to be protected from production of disinfection byproducts (trihalomethanes) at levels that exceed the Safe Drinking Water Act Maximum Contaminant Level for those compounds. The EPA representative stated that EPA is aware of concerns regarding increased levels of disinfection byproducts due to the presence of increased concentrations of bromide in surface waters and that she would report back on the status of criteria development.

Zinc Biotic Ligand Model-derived Criteria

A comment from the International Zinc Association recommended that the DEQ adopt a biotic ligand model (BLM) as the basis for freshwater zinc criteria in Virginia along with the copper BLM. Draft BLM-based zinc criteria were submitted to the EPA in 2006 by the International Lead Zinc Research Organization (ILZRO), but these criteria have not been released by the EPA for public comment. In addition, an updated evaluation of BLM-based criteria for zinc, including development of BLM-based acute and chronic criteria following the EPA guidelines for criteria development, has recently been published in the peer-reviewed journal *Environmental Toxicology and Chemistry* (DeForest and Van Genderen 2012). It was asked of the EPA panel member what was the current status regarding EPA progress towards BLM-based criteria for zinc. She stated she would check on that and report back.

Nutrient & Sediment Criteria

Comment from the Shenandoah Riverkeeper also requested that VA promulgate numeric criteria for nutrients and sediment in surface waters as well as address stream flow regime alteration through the WQS regulation. DEQ staff stated that VA has nutrient criteria in

place for lakes and reservoirs and for the Chesapeake Bay and its tidal tributaries. The subsequent Bay TMDL has resulted in nutrient and sediment load controls for almost two thirds of the flowing waters in VA. It was asked if DEQ was in a position to provide a timeline for promulgation of nutrient criteria for free-flowing fresh waters. DEQ staff responded that criteria for free-flowing wadeable streams are still under technical development and not ready for promulgation. It was then asked if DEQ has anything in development regarding sediment criteria. Staff responded there is not at this time. Sediment issues are currently addressed through the TMDL process in the following manner: if VASCI scores indicate aquatic life impairment and the TMDL study identifies sediment as a stressor, then sediment controls are implemented.

Human Health Criteria Revisions

It was requested that no human health criteria revisions based on reference dose (RfDs) that the Integrated Risk Information System (IRIS) has indicated has a low degree of confidence. DEQ's stance is that updates to human health criteria are based upon improvement to previous risk calculations and therefore represent better science deserving of criteria revisions.

Mixing Zones & Threatened and Endangered (T&E) Species

It was requested that there be no mixing zones allowed where T&E species are present. DEQ's position is that water quality standards and criterion are intended to be protective of all aquatic life, including T&E species, and consideration is given to the possible presence of T&E species prior to permit issuance during permit review.

Cyanide Freshwater Aquatic Life Criteria

It was requested that the cyanide freshwater criteria be amended based on a recent report: "Scientific Review of Cyanide Ecotoxicology and Evaluation of Ambient Water Quality Criteria: Final Report" (January 2007). Recalculated acute and chronic cyanide FW criteria are 23 and 4.8 µg/L... similar to the current acute and chronic criteria of 22 and 5.2 µg/L. DEQ considers the differences between the two as negligible with little benefit to be realized. The recalculated acute saltwater criterion of 5.5 µg CN/L is 5-fold higher than current acute marine criterion of 1.0 µg/L and includes toxicity data for a crab species not present in VA and, as such, may provide inappropriate SW aquatic life protection. The recalculated chronic SW criterion of 1.1 µg/L is only slightly different than the current chronic marine criterion of 1.0 µg/L.

Methylmercury Fish Tissue Criterion

It was suggested that the methylmercury fish tissue criterion should be evaluated to ensure that it is protective of federally listed T&E fish species, which are not human food sources. Virginia has mercury criteria calculated to be protective of all aquatic life. There are currently no data of which DEQ is aware to indicate any particular threatened or endangered species is particularly sensitive to either mercury or methylmercury.

Special Standard 'm'

A commenter suggested that regulatory history indicates the effluent limits for discharges to the Chickahominy watershed above Walker's Dam were to be solely applied to *municipal*

wastewater; the language is confusing and has resulted in applying the standard more broadly than intended. DEQ maintains that the special standard is not limited to municipal wastewater treatment facilities; however, the standard excludes discharges composed entirely of stormwater and non-mineral mining process discharges are addressed through a general permit.

It was asked if DEQ was considering amendments to the Antidegradation Policy portion of the WQS regulation based upon proposed changes to the federal antidegradation policy. DEQ staff responded antidegradation amendments are not being considered at this time as final amendments to the federal policy would not be published until after this triennial review is well under way.

Action Items

1. Copper BLM.
Does the copper BLM allocate all dissolved organic carbon (DOC) metal binding capacity to copper only? If there are other metals in the water that could bind with DOC, would this reduce the level of protection provided by the copper-BLM criteria? Consult with EPA.
2. Zinc.
What is the status of the development of a BLM for Zinc? Consult with EPA.
3. Manganese.
What information does EPA have concerning toxicity of manganese with regard to human health and/or aquatic life? Consult with EPA.
4. Selenium.
What is the status of EPA's national recommended criteria for selenium?
5. Bacteria criteria.
Can Virginia get an assurance that when used for assessing environmental data and there is a limited number of samples (such as one datum) within a 30 day period, that this will not have to be considered to represent a geometric mean and subsequently assessed against the recreational bacteria criteria geometric mean; but should be assessed using the STV instead? Consult with EPA.
6. Have the EPA's national recommended criteria for the protection of human health been updated to reflect the recent (2009-2012) changes to the reference dose and/or oral slope factors contained in IRIS database for the below chemicals?

Carbon tetrachloride
Cyanide, free
Hexachloroethane
Methylene chloride (listed in IRIS by its synonym Dichloromethane)
Nitrobenzene
Pentachlorophenol
Tetrachloroethylene
Trichloroethylene

7. Does EPA have any information or recommendations for limiting bromide in surface water to protect public water supplies? Consult with EPA.

8. What is the scope of carbaryl (Sevin®™) use in Virginia? Consult with VA Dept. Agriculture & Consumer Services.
9. Make the Virginia-specific selenium criteria recalculation report available on DEQ Rulemakings web page.
10. Brief Panel members RE: DEQ/DGIF/USFWS meeting on 1/9/2014 regarding freshwater mussel distribution in VA to Panel members.
11. Special standard 'm'.
Examine permit activity as relates to the application of special standard 'm' effluent limits only to municipal wastewater treatment facilities.

Handouts distributed at the December meeting:

Agenda

Copies of presentation slides