

AD HOC ADVISORY COMMITTEE MEETING SUMMARY
Triennial Review WQS
(Reassessment of six issues separated out from Triennial Review)
March 26, 2009

Welcome and Introductions

Advisory Committee Members and Alternates Present:

Alliance for the Chesapeake Bay (ACB): Chris French
Chesapeake Bay Foundation (CBF): Mike Gerel
Dominion Power (DP): Judson White
Department of Defense (DOD): Dave Cotnoir
Environmental Protection Agency (EPA): Cheryl Atkinson (by phone)
U.S. Fish and Wildlife Service (USFW): Cynthia Kane
VA Association of Municipal Wastewater Agencies (VAMWA): Jim Pletl, Dick Sedgely, Jamie Mitchell
VA Department of Conservation and Recreation (DCR): Charles Lunsford
VA Department of Health (VDH): Ram Tripathi, Dwight F
VA Department of Game and Inland Fisheries (DGIF): Amy Ewing
VA Manufacturers Association (VMA): John Heard, Tom Botkins

Other Attendees:

Northrup-Grumman Newport News Shipyard: Mark Hiltke, Frank Thorn, Ann Pharr,

DEQ Staff Present:

Alan Pollock (Facilitator), Fred Cunningham, Allan Brockenbrough, Alex Barron, David Whitehurst

Alan Pollock made introductions

1. Mixing Zone Prohibitions:

This issue involves the potential prohibition of mixing zones for persistent bioaccumulative toxic substances for new or expanded dischargers. This gives rise to a related question of what pollutants should be considered for discussion of this issue. For the sake of discussion at the TAC meeting, the members were presented with a list from the Chesapeake Bay Program's August 10, 2001 draft report, *Voluntary Mixing Zone Phase Out Strategy* and their Chemicals of Concern list as examples.

Allan Brockenbrough gave mixing zone presentation

VMA What are the concentrations for these compounds (PBTs) that protect aquatic life? Human health criteria were developed with calculations that incorporate a 70 year life span. The aquatic life criteria for these types of substances is usually much higher than human health criteria and the human health criteria is what drives the standard and existing permit limits.

Water sources may represent a small portion of the total environmental release of some of these PBTs. We should focus resources on the important sources.

CBF&USFW Do we account for small amounts that may affect aquatic life in ways that are not necessarily lethal?

CBF Does the no mixing zone policy/guideline for impaired waters apply to waters with human health impairments as is done for waters with aquatic life impairments? Are standards being met outside of mixing zones?

DEQ The no mixing zone policy for impaired waters is applied to human health impairments only when a water quality criterion in the water column is violated. It has not been applied when there is only a fish consumption advisory unless a TMDL has been performed. WQ standards are being met outside of mixing zones.

ACB One of the major issues RE: PBTs (i.e. PCB) is the lack of low level exposure data for aquatic life.

VMA Does VA have any permits with limits for PBTs?

DEQ There are some. A potential to exceed study is done during the permit application process that uses critical stream flows and conservative effluent data in a model to determine if there is a chance the discharge could exceed the human health criteria. If so than a limit for the compound in question is put in the permit.

CBF If the pollutant is “persistent” then it may not mix in the way the application of mixing zone concepts predicts. Does mercury or PCBs dilute or settle out...do they “mix” as is intended in the mixing zone? A small body of research indicates some mussels have reproductive problems at low levels of PCB.

USFW It is due to the above types of concerns that some states have end-of-pipe permit limits to meet the standard and are proactively removing mixing zones for PBTs. The purpose of narrative and numerical water quality standards is to provide a statement of how to protect water quality and these standards are implemented by guidance. The establishment of criteria and standards should not be limited by current technology.

Allan B. presented the St. Paul Clinch River discharge model. The model indicates that limits cannot meet WQS end-of-pipe but can meet standards within 10 feet. This was given as an example of the difficulty of literal end-of-pipe limits and that the discharge would impact a very small area.

CBF What have been impacts (economic, regulatory, etc) to those states that have MZ prohibitions for PBTs?

DEQ DEQ does not have that information but will survey other states through ASIWPCA.

USFW Given the unknowns and concerns with PBTs and considering the bioaccumulative nature of these pollutants, why would one consider anything other than end of pipe limits? Is it really OK to keep adding more of a bioaccumulative compound, e.g. mercury and/or PCB?

VMA Reminded group that a MZ cannot be used in lieu of treatment.

VAMWA Somewhere in the analysis of the PBT issue low level toxicity should be addressed and there is a need to collect more data to make some determinations regarding the actual need for PBT MZ prohibitions before pursuing it. A more comprehensive program is needed to address the role of other media RE: PBTs. Mr. Sedgely stated that DEQ has a rigorously conservative VPDES permit program and that development of WQS is to be "reasonable and practicable". Mr. Pletl also commented; somewhere in the analysis of the PBT issue toxicity should be addressed because compounds of concern must be persistent, bioaccumulative and toxic. DEQ has not yet defined PBTs therefore a ruling to eliminate mixing zones for PBTs is premature. A more comprehensive program is needed to address the role of other media and sources when making decisions regarding PBTs. DEQ's data shows less than 2% of impairments related to proposed PBTs are related to point sources and maybe even less are due to mixing zones. Most impairments are related to mercury and PCBs, which are air driven and/or legacy issues. We have limited resources and must focus on the biggest sources of PBTs if PBTs are causing a problem. Removal of mixing zones does not follow agency procedures; toxicants are regulated on a case by case basis rather than through bans on approach. We must also recognize that DEQ has a rigorously conservative VPDES permit program which will likely protect against the mixing zone concerns brought forward. Finally, development of WQS is to be reasonable and practical according to the triennial review NOIRA, the proposed action is not reasonable or practical.

USFW The WQS are regulatory statements of protection.....the suggestions in the Alternatives Slide (#37) are directed more towards the facilities. (2 of the alternatives are directed towards modification of a facilities mixing zone and 2 are directed towards outright elimination of MZ for PBTs...DW)

CBF There is a need for a definitive PBT list and they understand that removal of many PBTs from wastewater stream can be prohibitively expensive. Suggested that Pollutant Management Plans (PMP) be applied proactively instead of waiting until the receiving waters are listed as impaired.

DP They feel hesitant to pursue an across the board policy RE: PBTs with so many unanswered questions and an obvious need for more study into the situation.

ACB Their experience/understanding is that they do not see a number of PBTs diluting.

DCR Suggested analyzing sediment samples taken near discharges to determine persistence. Bioaccumulation occurs regardless of the presence of a MZ. Narrowing PBT list is important aspect of the process.

EPA Pleased to hear consideration of aquatic life as well as human health impacts and the suggestion of sediment sampling near discharges to determine persistence. Expressed some concern hearing of criteria exceedances within MZ in VA. This was followed by DEQ staff clarifying how evaluation of mixing zone is conducted in Virginia. There is a need to consider potential effects on the aquatic life not only in the mixing zone, but also for aquatic life passing through the mixing zone. EPA gives States some discretion in policies regarding mixing zones but applications of mixing zones must not violate Clean Water Act provisions. EPA does recognize the Clean Water Act does allow for a mixing zone, but expects that granting mixing zones for PBTs should be done very carefully and on a case by case basis. EPA's impression is that VA WQS regulation seems to broadly/adequately cover the MZ issue and that the current implementation of mixing zones in Virginia is pretty good, but there are lots of permit issues] and that when a discharge includes PBTs, there is a need to seriously consider the implications of allowing mixing zones for these pollutants.

2. Lead Conversion Factor:

This issue involves whether to apply the EPA conversion factor to the Virginia aquatic life criteria for lead to more accurately express the criteria concentrations as dissolved concentrations, i.e. convert "total" criteria to "dissolved" criteria concentrations. Are the conversion factors recommended by EPA for adjusting their criteria from "total recoverable" to a "dissolved" criterion appropriate for use with Virginia's criteria?

Alex Barron gave a presentation discussing the following:

DEQ's review identified all important toxicity tests that influence the final acute value (FAV) or final acute to chronic ratio (which represent the data that are the basis for the water quality criteria calculations) for both the EPA and the Virginia water quality criteria for lead for both freshwater and saltwater. DEQ obtained copies of all original papers for these important tests that are unique to the Virginia dataset. DEQ reviewed these papers to determine how the metals were measured, how the toxicity values were calculated and the type of tests involved and compared these to the type of tests that form the basis for the EPA FAV and final acute to chronic ratio in an attempt to determine if there are any significant differences between EPA's and Virginia's datasets.

If any of the toxicity tests that are important to the calculation of the lead FAVs (for either freshwater or saltwater) or the acute to chronic ratios that were used to calculate the Virginia lead criteria had calculated the lead concentrations in the tests based on dissolved measurements, this would indicate that the Virginia lead criteria were based partially on dissolved data and these data should not be adjusted with a conversion factor. Likewise, if the types of toxicity tests (e.g. duration and type of exposures in the toxicity tests and whether or not the animals were fed during the experiment) that form the basis for the Virginia criteria differed from the tests that form the basis for the EPA lead criteria; then this would suggest that the conversion factor developed by EPA for their lead criteria might not be accurate for the Virginia lead criteria.

None of the LC₅₀ values in either EPA's or Virginia's Final Acute Value (FAV) dataset were based on dissolved lead measurements. Also, the types of toxicity tests that are important to the Virginia dataset are the same types of tests that are important to the EPA lead criteria. This indicates that there are no significant differences in the types of data that form the basis for either of the EPA and Virginia criteria for lead.

Because there are no significant differences between the types of tests that are important to the Virginia criteria for lead and those that are important to the EPA lead criteria dataset, the conversion factor developed by EPA for their lead criteria can be considered appropriate for application to Virginia's criteria also.

VAMWA How does Acute /Chronic Ratio (ACR) compare with other metals' ACR?

DEQ Difficult to make these types of comparisons between metals as it is believed the chronic toxicity mechanism for lead is different from the acute toxicity. This makes comparison of lead ACR to that of other metals problematic.

VAMWA (Pletl) Has DEQ considered incorporating copepod test results submitted by VAMWA into a recalculation of the criteria?

DEQ When DEQ recalculated the lead criteria in 1997, one of the issues that were investigated was a concern about the single ACR for a saltwater species, a mysid shrimp. This ACR was higher than the other ACRs for freshwater species. There had been some concern discussed in the previous workgroup in 1997 that the reported acute value for this species might be higher than necessary because of some concern with solubility at the higher concentrations and the possibility that that not all of the lead at the acute LC₅₀ concentration would have been biologically available. Based on this speculation, if the acute value in this test was unnaturally high, this could result in an ACR larger than appropriate. Based on all the chronic data that were available at the time, DEQ decided to not use the saltwater ACR to calculate the freshwater criterion, but instead used a final ACR which was based on the mean of all ACRs for freshwater species (including two new ratios that had not been available to EPA in 1984). However, for the Virginia saltwater chronic criterion DEQ determined that the saltwater ACR for the mysid shrimp should be retained and used in the calculation of the chronic criterion for saltwater (as was done by EPA). DEQ reached this conclusion because different combinations of freshwater ACRs or other options considered resulted in calculating a chronic criterion that was under-protective based on available chronic toxicity data. In an effort to address this concern further, DEQ funded a new toxicity test with an estuarine copepod (*Eurytemora affinis*) to try to get an additional ACR for an additional saltwater species. Unfortunately, that test with the copepod did not result in a definitive assessment of reproduction because the test organisms did not reach reproductive maturity during the duration of the test, which was an unusual occurrence. The results of this additional toxicity test was that there was two new acute values and one chronic value (which would have produced an ACR of about 2 based on survival), but chronic effects on reproduction or growth could not be accessed. Discussions with EPA had indicated at the time that this indeterminate chronic test with copepod should not be considered adequate to act as a substitute for the original mysid shrimp ACR. EPA tends to be hesitant to ignore chronic data if it is good and the chronic value for the mysid shrimp appears to be good; the potential

concerns about this test have only been about the acute concentrations based on possible concerns with solubility issue at the higher concentrations. The new data from this Virginia funded copepod test are not part of the current Virginia criterion for lead in saltwater.

VAMWA (Pletl) Does DEQ feels their ACR is defensible?

DEQ Yes. Other options with lower ACRs produced potential chronic criterion concentrations that were higher than concentrations that had been reported for chronic effects in chronic toxicity tests, indication an under-protective criterion.

VMA How is VA lead criteria comparable to EPA's?

DEQ VA criteria are higher.

VAMWA (Sedgely) Expressed concern whether it is necessary to apply EPA's conversion factor to VA lead criteria. There seems to be much conservatism built into VA's lead criterion without the conversion factor.

DEQ Based on the data available at the time of the review and recalculation, the DEQ does not believe that there is much conservatism in the freshwater criterion. The final ACR used for the Virginia freshwater chronic criterion did not use the high ACR for the saltwater mysid shrimp but was a mean of all freshwater ACRs. This should be considered a moderate approach and reflects the newer ACRs available for two freshwater species. Other combinations of freshwater ACRs that produced a lower final ACR had been investigated but they produced chronic criterion concentrations that were higher than chronic values reported in tests with some freshwater species. Thus the use of another, lower ACR would have resulted in an under-protective criterion. Virginia's freshwater acute and chronic criteria for lead are less restrictive than the EPA freshwater criteria. The saltwater chronic criterion is based on the final ACR used by EPA and includes the ACR for the mysid shrimp, about which there could be some potential concern that it could be conservative. However, there were no other data available at the time of the review and recalculation that would have resulted in a different saltwater chronic criterion considered defensible. DEQ understands that EPA is currently conducting a review of the available toxicity data for lead for the possible update of the EPA lead criteria and this may result in a new recommendation from EPA in the future. DEQ will follow these developments and if newer data become available to justify a significant change in the current Virginia lead criteria, DEQ will consider this in the future.

In conclusion, DEQ feels that it would be appropriate to apply the conversion factors recommended by EPA to the Virginia lead criteria.

3. Future Meeting Subjects:

The next meeting of the committee will be held on April 29, 2009. The subjects to be discussed will be the potential for recalculating the water quality criteria for cadmium and cyanide based on reviews and reports that have recently been made available.