West Virginia
PO Box 3923, Charleston, WV 25339 • (

All comments herein pertain to 47 CSR 2

October 12, 2012

Mr. Kevin Coyne
West Virginia Department of Environmental Protection
Division of Water & Waste Management
601 57th Street
Charleston, WV 25304
Via Electronic Mail: Kevin.R.Coyne@wv.gov

Dear Mr. Coyne:

Pursuant to the public notice published by the West Virginia Department of Environmental Protection (WV DEP), attached to this letter please find the comments and observations of the West Virginia Coal Association (WVCA) regarding the agency's planned rulemaking efforts for the 2014 triennial review of West Virginia's water quality standards.

The West Virginia Coal Association (WVCA) is a non-profit state coal trade association representing the interests of the West Virginia coal industry on policy and regulation issues before various state and federal agencies that regulate coal extraction, processing, transportation and consumption. WVCA's producing members account for 98 percent of the Mountain State's underground and surface coal production. WVCA also represents associate members that supply an array of services to the mining industry in West Virginia. WVCA's primary goal is to enhance the viability of the West Virginia coal industry by supporting efficient and environmentally responsible coal removal and processing through reasonable, equitable and achievable state and federal policy and regulation. WVCA is the largest state coal trade association in the nation.

Overall, WV DEP is to be commended for the pronounced improvements to the water quality standards rulemaking process since assuming that duty from the Environmental Quality Board (EQB) in 2005. The professional manner in which WV DEP considers revisions to the program continually improves as does the agency's commitment to science, public involvement and adherence to the public policy goals established by the West Virginia Legislature. WVCA believes the 2014 triennial review provides yet another opportunity for WV DEP to advance the effectiveness of the program by addressing several areas of concern the agency inherited from the EQB.

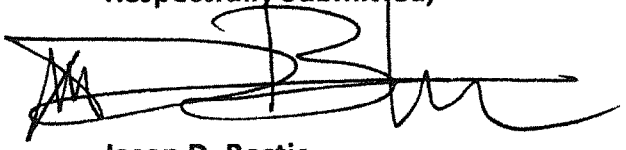
WVCA's comments and suggestions will focus on several areas where action by WV DEP is overdue to address historic issues with the water quality standards program. These are long standing areas of confusion, created not by the current agency or administration, that have impacted the practical function of the water quality standards program, and more importantly, the Clean Water Act (CWA) Section 402 NPDES permitting process for decades. In most cases, these specific instances lack any rational basis and have no equal in corresponding federal regulations implemented by the federal Environmental Protection Agency (EPA) or the water quality standards programs of other states.

These areas include specific water quality standards where the state maintains outdated criteria, long ago replaced by more scientifically defensible standards, revisions to specific standards that would increase practical environmental and stream protection, application of designated use that needlessly complicates the assignment of effluent limitations and, in at least two instances, where WV DEP maintains EQB-created interpretations of state standards that are in direct contravention of the public policy of the state as expressed by the West Virginia Legislature. The interpretative issues of concern deserve distinct attention from the agency, as they represent not only instances where WV DEP ignores the will and intent of the Legislature but also cases where the agency perpetuates what is essentially illegal rulemaking by maintaining positions and "standards" that were never subject to the public comment and review process. Positions relative to use designations such as those identified in our subsequent comments are perhaps the worst examples of how West Virginia's regulatory climate discourages new investments and hastens the departure of existing operations.

WVCA's comments regarding a specific water quality standard or interpretation of existing standards should in no way be construed by WV DEP as advocating that the agency delay any current initiatives until the completion of triennial review in 2014.

WVCA appreciates the opportunity to provide these comments regarding possible revisions to the state's water quality standards rule to the WV DEP.

Respectfully Submitted,



Jason D. Bostic
Vice-President

COMMENTS OF THE WEST VIRGINIA COAL ASSOCIATION:

2014 TRIENNIAL REVIEW OF WEST VIRGINIA'S WATER QUALITY STANDARDS

General Comments

While the West Virginia Department of Environmental Protection (WV DEP) has greatly improved the water quality standards rulemaking process since assuming that duty from the Environmental Quality Board (EQB) in 2005, there remains several areas where the agency needs to correct historical issues inherited from the Board. In these areas, WV DEP can build on the notable progress made to date by providing more rationality to the program.

In conducting this review and examination of West Virginia's water quality standards program, WV DEP is guided not only by science but also by the principles of public policy as established by the West Virginia Legislature. With respect to water quality standards and Clean Water Act (CWA) Section 402 permitting, this declaration of public policy is contained in the West Virginia Water Pollution Control Act (WV WPCA):

> It is declared to be the public policy of the state of West Virginia to maintain reasonable standards of purity and quality of the water the state consistent (1) public health and public enjoyment thereof; (2) the propagation and protection of animal, bird fish, aquatic and plant life; and (3) the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development.[1]

[1] W.Va. Code 22-11-2.

WVCA believes in several instances, detailed in subsequent comments, WV DEP maintains water quality standards far beyond "reasonable standards of purity and quality" that certainly do not promote "healthy industrial development" that is necessary or consistent with "the expansion of employment opportunities." In the case of the agency's interpretation of certain use designations, its position is the very antithesis of these stated goals and policy-- one that is not necessary to protect or enhance the public health and welfare and at the same time needlessly discourages development and investment.

Further guidance regarding rulemaking is provided by the Legislature to the agency in WV DEP's authorizing statute:

> ...legislative rules promulgated by the Director...may include provisions which are more stringent than the counterpart federal rule or program to the extent that such provisions are reasonably necessary to protect, preserve or enhance the quality of West Virginia's environment or human health or safety, taking into consideration the scientific evidence, specific environmental characteristics of West Virginia or an area thereof, or stated legislative findings, policies or purposes relied upon by the director in making such determination. In the case of specific rules which have a technical basis, the director shall also provide the specific technical basis upon which the director has relied. [2]

As our detailed comments explain, in many cases WV DEP has maintained standards and interpretations that completely fail to satisfy the Legislature's specific constraints on the agency's rulemaking authority. Consider beryllium (*see subsequent comments*) where WV DEP maintains criteria that were rejected by the federal Environmental Protection

[2] W.Va. Code 22-1-3a.

Agency (EPA) and replaced with a more scientifically defensible standard several years ago. Such a standard is not "reasonably necessary to protect, preserve or enhance the quality of West Virginia's environment" nor has WV DEP "provided the specific technical basis upon which the director has relied" to maintain this flawed standard to the Legislature.

In other cases, WV DEP has shunned the responsibility conferred on it by the Legislature by ignoring substantial evidence that current standards do not reflect "reasonable standards of purity and quality." Rather than undertaking research and rulemaking to develop a standard which "takes into consideration the scientific evidence, specific environmental characteristics of West Virginia or an area thereof", the agency submissively waits for revision of federally-recommended standards. As a federal judge recently observed *"...Section 303 of the* [federal] *CWA allocates primary authority for the development of water quality standards to the states."*[3] When scientific information and the guiding public policy of the state demonstrate a need, WV DEP should exercise this "primary authority" and develop standards specifically for West Virginia.

WVCA urges WV DEP to consider any revisions to the state's water quality standards in the context of the public policy enunciated by the Legislature and the directives established for the agency in statute.

[3] *State of West Virginia, et.al. v. Jackson*, F.Supp.2d, 2012 WL 3090245 (D.D.C., July 31, 2012).

Aluminum Criteria

While West Virginia has made great strides in revising its water quality standards for aluminum to reflect the prevailing natural conditions within the state's waters, WVCA believes that further efforts are necessary to adopt truly protective criteria. Because aluminum is a very common, naturally occurring element, many streams in the state exceed the numeric criteria for aluminum, with no corresponding signs of impairment to the aquatic life. The result is a CWA Section 303(d) list of "impaired waters" with several streams identified as impaired for aluminum, mandating the preparation of Total Maximum Daily Load (TMDL) at state expense, to bring those waters into compliance with a flawed standard. Additionally, reliance on the current aluminum standard has burdened NPDES permit holders as they struggle to maintain compliance with a standard that, from an aquatic life use protection standpoint, is meaningless.

As with many other metals, the toxicity of aluminum is inversely related to water hardness. In other words, aluminum's toxicity to aquatic life decreases as the water hardness increases. EPA has developed hardness-dependent equations for a number of metals to reflect this relationship. For example, West Virginia has adopted EPA's hardness-dependent equations for other metals such as cadmium, trivalent chromium, copper, lead, nickel, silver, and zinc. Similar hardness-based criteria should be adopted for aluminum to reflect the actual toxicity of the constituent.

Other states have adopted similar hardness-based aluminum standards. New Mexico recently adopted a hardness-based standard that was approved by EPA in April 2012.[4] The State of Colorado received EPA approval of its hardness-based standard in August 2011.[5]

On September 21, 2011, WVCA provided a formal submission to WV DEP regarding the state's aluminum standard. The submission contained a proposed update of West Virginia's aluminum criteria to a hardness-based standard using the same methods used in calculating the revised standards for Colorado and New Mexico. WVCA has attached this submission and supporting scientific rationale to these comments in its entirety as attachment "C". WVCA urges WV DEP to adopt a hardness-based standard for aluminum to better protect aquatic life and simplify NPDES compliance with the aluminum criteria.

Beryllium Criteria

In the case of beryllium, WV DEP has maintained water quality criteria that was proposed, but then specifically rejected, by EPA. West Virginia's public drinking water supply/Category A criterion for beryllium is 0.0077 µg/l. However, the national recommended criterion for beryllium for the protection of human health is 4 µg/l, which is the maximum contaminant level (MCL) for drinking water. The West Virginia beryllium criterion is nearly three orders of magnitude below the EPA recommended standard.

[4] *See generally* attachment "A", Letter dated April 30, 2012 from EPA Region VI to the New Mexico Surface Water Quality Bureau.
[5] *See generally* attachment "B", Letter dated August 4, 2011 from EPA Region VIII to the Colorado Water Quality Control Commission.

The current West Virginia criterion appears to be based upon a proposed federally recommended criterion published in 1991.[6] ***This proposed rule was never adopted by EPA, and the proposed criterion of 0.0077 µg/l does not appear in any past version of EPA's nationally recommended water quality criteria.*** This discarded federal recommendation remains in effect for the state and as virtue of its misplaced and illegal application of Category A use designation (see subsequent comments), is being applied on all streams to all NPDES permits by WV DEP.

Following the publication of the proposed human health water quality criteria, EPA promulgated the beryllium MCL of 0.004 mg/l in July 1992. West Virginia adopted its current beryllium criterion of 0.0077 µg/l in 1993; a full year *after* EPA adopted the beryllium MCL that remains the national recommended criterion to this day. Therefore, West Virginia's beryllium criterion was not based upon the best available science in 1993, and it certainly is no more scientifically justifiable now.

WVCA urges DEP to adopt the beryllium MCL of 0.004 mg/l as the human health Category A criterion. This standard has been reaffirmed by EPA as recently as 2008, when EPA published a draft Integrated Risk Information System (IRIS) reassessment that proposed no changes to the reference dose upon which the beryllium MCL is based.[7]

[6] 56 Federal Register 58420, November 6, 1991, pg. 58442.
[7] *See generally* "Toxicological Review of Beryllium and Compounds" published by EPA in April 1998 and available at http://www.epa.gov/iris/subst/0012.htm

Selenium Criteria

An ever-growing body of scientific evidence and data confirms that continued application of the current selenium criteria to West Virginia waters is misplaced and offers no measurable improvement to environmental protection while causing widespread and extraordinarily expensive compliance issues. EPA previously determined the current standard is incorrect and has been struggling to complete a rulemaking to revise the federally recommended selenium standards. The West Virginia Legislature has previously concluded the current federally-recommended selenium limits may not be appropriate for West Virginia:

> The Legislature finds that there are concerns within West Virginia regarding the applicability of the research underlying the federal selenium criteria to a state such as West Virginia which has high precipitation rates and free-flowing streams and that the alleged environmental impacts that were documented in applicable federal research have not been observed in West Virginia... [8]

WVCA continues to believe WV DEP should contemplate revisions to the current standards for selenium. Despite near universal acknowledgement that the current selenium criteria is incorrect, and ignoring the findings of the Legislature, WV DEP has yet to take any action on its own initiative to develop a sensible, protective criteria for West Virginia. The agency has even demonstrated a hesitancy to act on site-specific criteria applications that would simply apply the selenium criteria in terms of dissolved vs. total measurements. This inaction has occurred as selenium has become a modern equivalent of the aquatic life use

[8] W.Va. Code 22-11-6.

standard for manganese, where treatment was undertaken just for the sake of satisfying a baseless standard that most states chose NOT to adopt.

WVCA recommends WV DEP, in accordance with its charge from the Legislature as the agency vested with developing water quality standards for the state, enlist the assistance of state research resources such as those available at the West Virginia Water Research Institute, West Virginia University and Marshall University and actively pursue revisions to West Virginia's water quality standard for selenium instead of simply waiting for EPA to take action on a federally-recommended criteria.

Category A Use Designation

WV DEP continues to operate its NDPES permitting program under the regulatory illusion that all state waters are classified as Category A and serve in their entirety as public drinking water supplies. This myth was originally formed by the Environmental Quality Board (EQB) when it possessed water quality standards rulemaking authority and WV DEP was a willing accomplice in maintaining this illegal presumption by assigning NPDES effluent limits as though all waters were legally classified as such. When the West Virginia Legislature transferred rulemaking authority from the EQB to WV DEP in 2005, the agency simply adopted the EQB's misplaced interpretation. As we detail in subsequent paragraphs, this tortured interpretation is contrary to the official actions of the West Virginia Legislature and represents a decades old illegal rulemaking action that is ripe for action.

West Virginia's water quality standards, like those of virtually all other states, establish allowable in-stream concentrations of various criteria depending on the "use" served by a given water body. These standards also recognize and define allowable "uses" to which the criteria apply. West Virginia's federally-approved water quality standards, codified as 47 CSR 1, provide that all waters of the state are considered to serve as Category B/aquatic life use and Category C/water contact recreation use. More simply, West Virginia's water quality standards default all streams to Category B/aquatic life use or Category C/water contact recreation use. Despite the actions of WV DEP with respect to assigning Category A/public drinking water supply effluent limits to all state streams, the approved regulation is clear and unambiguous:

> These rules establish general Water Use Categories and Water Quality Standards for the waters of the State. Unless otherwise designated by these rules...all waters of the State are designated for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C) consistent with Clean Water Act goals...[9]
>
> Category A-- Water Supply, Public. -This category is used to describe waters which, after conventional treatment, are used for human consumption...[10]

If there was any doubt as to the meaning of the above-cited provisions, the intent of the EQB was clearly articulated in the Board's rationale document: "above all, [the EQB

[9] 47 CSR 2-6.1
[10] 47 CSR 2-6.2

members] agreed that the category and criteria for public water supplies should not be applied to stream or stream segments where no one is using the waters for drinking."[11]

Notwithstanding the clarity of the rule and the supporting rationale offered by the EQB, WV DEP mistakenly applied the Category A use designation to all waters of the state. This regulatory practice began with the entire length of substantial streams where drinking water intakes were actually located and, as the NPDES regulatory program matured, was extended to every stream within the state.

Predictably, this application of Category A designation presented practical NPDES compliance issues as public water/human health standards are typically dramatically lower and include a more comprehensive list of parameters than required for maintaining West Virginia's legal default designation of all a streams as Category B/aquatic life use and Category C/water contact recreation use.

In 1995, the EQB upheld WV DEP's misapplication of effluent limits based on the statewide Category A fallacy.[12] However, an administrative appeal decision CANNOT alter state water quality standards nor can the EQB sanction an effort by WV DEP to modify a water quality standard or any other legislative rule through application of permit specific effluent limits. If that were the case, there would be no need for the state's public comment and review procedure, or the legislative rulemaking process.

---

[11] State Water Resources Board, Rationale Document for Revision of Legislative Rules. January 6, 1986. Relevant pages provided as attachment "D".

[12] *See generally* E. I. du Pont de Nemours and Company, Inc. v. Chief, Office of Water Resources, Division of Environmental Protection, Appeal Nos. 599 & 602 (December 13, 1995).

Apparently realizing that such an interpretation, where the EQB sanctioned WV DEP's modification of a rule without public comment and/or Legislative review was untenable, both agencies sought to officially alter the rule to fit their confused interpretation. *Each and every time these efforts have been unequivocally rejected by the Legislature.*

In response to the regulatory confusion created by WV DEP's flawed belief that all waters of the state are Category A/public drinking water supplies, on March 21, 1999 the West Virginia Legislature passed House Bill 2533. Signed into law by the Governor on April 2, 1999, the bill authorized the state's water quality standards to remain in place until October 1999, with the condition that:

> ...the Environmental Quality Board shall review, revise and propose, within this statutory deadline, and in accordance with the provisions of chapter twenty-nine-a of this code, emergency and legislative rules to address interpretive differences regarding the designation of category A waters and analyze the need for distance prohibitors for the policies of public drinking water intake...[13]

In response to the instructions of the Legislature contained in House Bill 2533, the EQB promulgated an emergency rule in October 1999 in which it proposed classifying all waters of the State as Category A/public drinking water supplies: "The proposed amendment clarifies that all waters of the State are protected by the drinking water supply designated use category..."[14] The emergency rule was filed

[13] *See generally* Enrolled Committee Substitute for House Bill 2533, Copy provided as attachment "E"
[14] *See generally* Notice from the EQB dated October 18, 1999 regarding the filing of an emergency rule, copy provided as attachment "F".

with the Secretary of State and, in accordance with W.Va. Code 29A-3-15, was effective pending approval or disapproval by the West Virginia Legislature.

As the Legislature began its consideration of the emergency rule in the 2000 Regular Session, the Senate Judiciary Committee sought to validate the positions offered by the EQB and WV DEP that all state waters were already designated as Category A and the emergency rule did nothing more than formally codify that designation.

In response to an inquiry from the Committee, EPA responded that the October 1999 emergency rule constituted a change to West Virginia's approved water quality standards regulations and as such would require the approval of the federal agency:

> The Environmental Protection Agency understands that the Environmental Quality Board has ***proposed*** to designate all waters of West Virginia as public drinking water supply... We hope that this letter provides West Virginia with a better understanding of what EPA Region III would expect should West Virginia decide to ***pursue*** a statewide re-designation of Category A (*emphasis added*).[15]

The letter from EPA to the Committee made it clear that, contrary to the assertions of the EQB and the NPDES permitting practices of WV DEP, West Virginia's streams were presumed to serve NOT as public drinking water supplies but instead as Category B/aquatic life use and Category C/water contact recreation use. Based on EPA's response that the EQB's emergency rule amounted to a statewide re-designation of all streams, the Legislature expressly rejected the October 1999 proposal from the EQB:

---

[15] Letter dated February 12,2000 from EPA Region III Associate Director- Office of Watersheds to West Virginia Senate Judiciary Chairman William Wooten. Copy provided as attachment "G".

> The emergency rule relating to the environmental quality board...filed in the state register on the eighteenth day of October, one thousand nine hundred ninety-nine..is repealed and not authorized.[16]

Despite the clear rebuke of the October 1999 rule by the Legislature and EPA's view that under the approved water quality standards program of the state that all streams defaulted to Categories B and C, WV DEP perpetuated the EQB's deceptions regarding stream designation in NPDES permitting by assigning Category A effluent limitations to all discharges.

Arrogantly ignoring the conclusions of the Legislature (and apparently assuming that the EQB and not the Legislature served as the final rulemaking body for West Virginia), WV DEP went so far as to publicly proclaim the agency will "continue its position [regarding Category A application in NPDES permits] unless directed to do otherwise by the [Environmental Quality] Board."[17] This conceited and illegal interpretation on behalf of WV DEP endures to this day; needlessly confusing the assignment of NPDES effluent limitations for several parameters such as beryllium (*see previous comments*).

Subsequent to the 2000 rejection of the emergency rule, the EQB sought to bypass the Legislature and bootstrap the Category A use classification to the entire state by promulgating a procedural rule which would have created a process to remove the (nonexistent) Category A designation. With the

---

[16] Enrolled Committee Substitute for House Bill 4223. Relevant page provided as attachment "H".
[17] See attachment "I", copy of July 7, 2001 article appearing in the Charleston Gazette.

procedural rule filing, the EQB relied on WV DEP's illegal interpretation under the NPDES program to justify the need for the use removal process, evidently assuming that WV DEP possessed a higher rulemaking authority than the Legislature:

> The current implementation of Category A by the Division of Water Resources of the [DEP] in the [NPDES] permitting program is that the designated use [of Category A Public Water Supply] applies to all waters of the state, unless it has been removed specifically by the Board. The Board supports this interpretation and application of the Public Water Supply use.[18]

Based on concerns raised by NPDES permit holders that the EQB was once again trying to extend the Category A designation statewide, the Legislature decided to review the procedural rule. The Legislative Rulemaking Review Committee properly concluded the EQB was seeking to bypass the Legislature entirely and codify the illegal Category A assumption by way of the procedural rule:

> We have reviewed 46 C.S.R.7, "Procedural Rule Governing Reclassification of Water Designated for Public Water Supply, which was filed on January 8, 2003. This procedural rule allows the Environmental Quality Board to remove the Category A (public water supply use) that is described in the water quality standards (46 C.S.R. 1). ***In effect, the Board would use a procedural rule 46 C.S.R. 7 to amend a legislative rule, 46 C.S.R. 1, without legislative review. As co-chairpersons of the Legislative Rule-Making Review Committee, we must reject any procedural rule such as 46 C.S.R. 7 that functions as a legislative rule, in derogation of West Virginia Code §§29A-3-1 et seq*** (*emphasis added*).[19]

[18] *See generally* "Statement of Circumstances Requiring Proposed Rules." Filed by the EQB on September 17, 2002. Copy provided as attachment "J".

[19] *See generally* March 5, 2004 2003 letter from Senator Mike Ross and Delegate Virginia Mahan, Co-Chairs, Legislative Rulemaking Review Committee to Edward Snyder, Chair, EQB. Copy provided as attachment "K".

Defiantly, the EQB continued to believe its own regulatory illusion regarding the drinking water designation and WV DEP blindly followed, applying effluent limits to all NPDES permits based on the Category A use. The frustration created by this "alternative reality" forced the coal industry to pursue a revision to the water quality standards culminating with the adoption by the Legislature in 2004 of a revised water quality standard for manganese.

Under the revised manganese standard, the drinking water standard (which is based on EPA's secondary, non-enforceable, organoleptic recommended criteria) applies five miles above public and private drinking water intakes. When this revised manganese criteria was approved by EPA in 2005, the federal agency noted that application of Category A standards at the point of intake was reasonable and entirely consistent with the approach approved by EPA in other states:

> The application of a criterion for the protection of public water supply at the intake point is consistent with EPA's approvals in other states. EPA has approved applications of human health criteria at the intake or withdrawal points in other states as well. See 35 Ill. Adm. Code § 303.202; Ind. Adm. Code §2-1-3; 401 Ky. Adm. Regs. § 5:031; Ohio Adm. Code §3745-1-07; Sec. 5.[20]

With its approval of the revised manganese standard, EPA also reaffirmed its February 2000 interpretation of West Virginia's legal, default use designations. More importantly, with respect to any future deliberations by WV

[20] Letter dated June 29, 2005 from EPA Region III to the EQB approving the Manganese Five Mile Rule. Copy provided as attachment "L".

DEP with respect to statewide use designations, EPA found the approach taken in the new manganese criteria- protection at the point of intake- entirely protective of the human health standard:

> Therefore, this change in the water quality standard should not have an impact on the water withdrawn for drinking, the drinking water treatment processes and he cost of treating water for drinking. ***All water withdrawn for drinking by private and public intakes that was covered under the designated use and thus protected by the manganese criterion prior to the Mn [manganese] 5-mile rule continues to be subject to the applicable 1 mg/L manganese criterion***. Therefore, application of the Mn 5-mile rule continues to protect the public water supply use, as defined (*emphasis added*).[21]

It was convenient for WV DEP to hide behind the EQB's irrational conclusions with respect to the Category A use designation while the Board held responsibility for water quality standards rulemaking authority. However, WV DEP did not disagree with or oppose the legislation to transfer that rulemaking power from EQB to the agency in 2005. *Since that legislative action, WV DEP is now responsible for perpetuating both manifestations of the Category A deception:* the myth, believed by no official body outside of the agency and the EQB, that state water quality standards actually assign the drinking water supply designation statewide, and the assignment of Category A-based effluent limitations to NPDES permits.

[21] Letter dated June 29, 2005 from EPA Region III to the EQB approving the Manganese Five Mile Rule. Copy provided as attachment "L".

As it is now responsible for every aspect of the Category A regulatory delusion, the agency must consider a practical question created by EPA's approval of the revised manganese criterion in 2005: If application of the Category A use designation at the point of intake is protective of "all water withdrawn for drinking by public and private intakes" and if "application of the Mn 5-mile rule continues to protect the public water supply" use as EPA observed with respect to the manganese criteria, then what coherent basis does WV DEP have for maintaining the EQB's fantasy that all waters of the state have been properly designated as drinking water supplies?

An approach similar to that taken with the manganese standard, that is application of the criterion at the point of intake, has already been found by EPA to be protective and an analogous approach with respect to all Category A parameters would be similarly protective and resolve the confusion created by the agency's current illogical and illegal position.

Narrative Criteria Implementation / Biological Stream Measurements

In its 2012 Regular Session, the West Virginia Legislature passed Senate Bill 562, directing WV DEP to develop rules to measure compliance with the state's narrative water quality standard.[22] Signed by the Governor on March 16, 2012 the bill requires WV DEP to develop a measurement tool that considers the

[22] *See generally* Enrolled Committee Substitute for Senate Bill 562, copy provided as attachment "M".

"holistic health of the aquatic ecosystem." WVCA believes adherence to the provisions of this legislation will improve the effectiveness of the state's water quality program by assuring public and legislative involvement in the development of an assessment tool to measure attainment of the state's narrative water quality standard. WV DEP historically relied on an assessment tool referred to as the West Virginia Stream Condition Index (WV SCI).

Like the provisions of House Concurrent Resolution (HCR) 111, which was adopted by the Legislature in 2010[23], Senate Bill 562 expresses legislative intent with respect to the narrative water quality standard and makes it clear that singular reliance by the agency on the WV SCI is indefensible. The passage of Senate Bill 562 also reinforces previous statements and objections regarding WV DEP's sole reliance on the WV SCI which myopically focuses on certain benthic species at the exclusion of other components of the stream ecosystem. *Further, the WV SCI is not a water quality standard and has never been subject to the formal rulemaking process which would involve not only public participation but review and approval by the Legislature.*

The agency's misplaced reliance on the WV SCI created a treacherous situation beginning in 2009 when EPA, initially through CWA Section 404 permits processed by the U.S. Army Corps of Engineers, seized upon the WV SCI and other non-official biological measurements to allege violations of West Virginia's narrative criteria. The resulting

[23] *See generally* House Concurrent Resolution No. 111, copy provided as attachment "N".

regulatory confusion quickly migrated to the CWA Section 402 permitting program administered by WV DEP and virtually paralyzed mine permitting activities within West Virginia.

The opportunity for stability and predictability was only recently restored to the permitting program through federal court decisions. Contained within these rulings is a clear conclusion that EPA usurped the powers reserved by Congress to individual states: *"...Section 303 of the* [federal] *CWA allocates primary authority for the development of water quality standards to the states."*[24]

With the recent federal decisions making it clear that rulemaking belongs to individual states and the Legislature providing insight as to the appropriate factors that should be considered in developing narrative standards assessment methods to satisfy the public policy goals of West Virginia, WV DEP should move quickly to finalize a new narrative standards measurement.

Trout Stream Designations

WVDEP's current process, again inherited from the EQB, for designating streams as trout waters and applying trout criteria is convoluted and nearly incomprehensible. WV DEP, despite its clear responsibility for these determinations, blindly relies on data and recommendations provided by the West Virginia Department of Natural Resources (WV DNR), an agency that has no environmental regulatory responsibility. Lack of clarity on this

[24] *State of West Virginia, et.al. v. Jackson*, et. al. F.Supp.2d, 2012 WL 3090245 (D.D.C., July 31, 2012).

issue lead the West Virginia Legislature to completely reject two recent attempts by WV DEP to expand the "codified" list of trout streams contained in the water quality standards rule. WVCA believes the 2014 triennial review provides an opportunity for the agency to establish more practical criteria for trout stream use designation.

"Trout waters" are defined in Subsection 2.19 of 47CSR2 as "waters which sustain year-round trout populations." Appendix A to 47CSR2 contains a list of "known trout waters." Streams have been added or removed from this list during past rulemaking exercises without providing the public with any data or information regarding whether the streams sustain year-round trout populations. Once a stream is placed on the list, the trout stream designation cannot be disputed later in a challenge to a specific NPDES permit limit and can only be changed through the Legislature or by a wholesale rule challenge.

If a stream is not on the codified list of known trout waters contained in Appendix A, WVDEP must demonstrate that the stream sustains a year-round trout population before applying trout stream criteria to it. *The process by which WVDEP makes this determination is not entirely clear.* In addition to the list in Appendix A, WVDEP also *reportedly* maintains one or more internal lists of trout waters, which are not readily accessible to the public. In addition, WVDEP relies heavily on consultation with WV DNR. These internal lists are apparently updated between the two agencies with no public notice and comment period. Should WV DEP assign permit limits as though a receiving stream is trout water based on these internal lists that are developed with WV DNR, the permit applicant is left with

nowhere to turn. WV DEP passively points to WV DNR as the basis for the determination, positioning the applicant to dispute effluent limits with an agency that has no environmental permitting role. *This practice results in a regulatory* ***"twilight zone"*** *where one agency with permitting responsibility relies on another that has no regulatory obligation in determining appropriate effluent limits.* Additionally, it creates a process whereby the WV DEP simply ignores other important requirements related to true cold water trout streams, such as temperature regimes, and ignores the reality that many of the "listed" streams are not cold water streams in need of more restrictive water quality criteria. WV DEP should end this practice of relying on consultation with WV DNR without providing some form of public notice regarding the factual bases upon which WV DNR has relied when it concludes that a stream is a trout water.

Members of the regulated community often are not aware that WVDEP considers a particular stream to be a trout water until WVDEP imposes trout-based effluent limitations in an NPDES permit. This sometimes occurs after a stream or stream segment has been listed on the CWA Section 303(d) list as being impaired for one or more trout criteria. While the public can comment on draft 303(d) lists, regulated entities often do not become aware that such listings have occurred until they are directly affected when a permit writer uses the 303(d) listing as the basis for imposing more stringent effluent limits based on trout criteria. At a minimum, the water quality standards rule should state that regardless of any past designation or listing of a stream or stream segment as a trout water, including on a

303(d) list, whenever WVDEP imposes new, more stringent effluent limitations in an NPDES permit based on trout criteria, the permittee can challenge the trout stream designation in an appeal to the EQB. The water quality standards rule should make it clear that a stream or stream segment's inclusion on a 303(d) list for impairment of a trout water criterion does not prohibit a permittee from challenging trout-based effluent limits in a permit appeal to the EQB.

WVCA suggests that WV DEP use the opportunity provided by the 2014 triennial review water quality standards rule to include a fair mechanism for challenging trout water designations by appealing them to the EQB, where a thorough examination of the factual basis for the trout stream designation can be undertaken.

WV DEP should also strongly consider revising the trout stream designation to distinguish naturally reproducing native trout waters and other waters, such as reproducing non-native trout waters, waters stocked with native species of trout, and waters stocked with non-native species of trout. Such a "refined" trout stream designation would allow for the assignment of effluent limits as appropriate to protect the various classes of trout waters, acknowledging that certain trout populations may need more protective standards than others. Similar "tiered" designations exist in other states and should be reviewed by WV DEP as possible models for a revised trout stream use designation.

PRESTIGE financial

WHERE INTEGRITY & CUSTOMER SERVICE COME FIRST SINCE 1956

Activation Code: GHT-729589

Attn: Business Owner

$125,000 Pre-Approved Loan

You have been pre-approved for a working capital loan based on information reported by Dun & Bradstreet. Our simple loan options allow you to get needed capital with minimal documentation. You have already been pre-approved based on your length of time in business as well as annual sales. You can access the funds in as quickly as 24 hours. Please give me a call at **305-290-6742** to discuss your finance options.

- **Funding as quickly as 24 hours**
- **No personal credit score requirements**
- **Minimal documentation**
- **Fast & Simple**

I look forward to working with you!

Best Regards,
John Williams
305-290-6742
National Account Manager

Prestige Financial is a full spectrum nationwide lender offering financing for all industries. We are extremely competitive and pride ourselves with our outstanding customer service and client retention. Don't hesitate to call regardless of your finance needs.

UNITED STATES ENVIRONMENTAL PROTECT
REGION 6
1445 ROSS AVENUE, SUITE 1200
DALLAS, TX 75202-2733

APR 30 2012

West Virginia Coal Association
2014 Triennial Review Comments
October 12, 2012
Attachment "A"

James P. Bearzi, Chief
Surface Water Quality Bureau
New Mexico Environment Department
Harold Runnels Building (N2050)
P.O. Box 5469
Santa Fe, NM 87502-5469

Dear Mr. Bearzi:

I am pleased to inform you that the Environmental Protection Agency (EPA or the Agency) has completed its review of the ***Standards for Interstate and Intrastate Surface Waters* 20.6.4. NMAC**. Revisions to New Mexico's water quality standards were adopted by the New Mexico Water Quality Control Commission and filed in accordance with the State's Water Quality Act on November 1, 2010. EPA initiated its review when these revisions became effective as State law on December 1, 2010. EPA reviewed and took action on the majority of the State's revisions on April 12, 2011.The Agency decided to take some additional time before acting on other revisions in order to allow both the New Mexico Environment Department an opportunity to provide additional supporting information and to enable a more detailed review of the State's new metals criteria. In today's decision, EPA is approving the majority of the remaining new/revised amendments with one exception, described below.

After further review, we have determined that the provisions found at section **20.6.4.10 D. Site-specific criteria** represent implementation procedures and do not constitute water quality standards that require EPA's review or action under Clean Water Act (CWA) Section 303(c) and, as such, will not be taking action on them. Furthermore, we had no obligation to act on section **20.6.4.10 D. Site-specific criteria** in our April 12, 2011, action and hereby rescind the previous EPA action on the provision. Any site-specific criteria adopted under this provision, however, would constitute new water quality standards subject to EPA review and approval or disapproval under CWA Section 303(c) on a case-by-case basis.

EPA is approving the revised language in section **20.6.4.13 J. Turbidity,** with the expectation that the revised provision will be implemented consistent with the antidegradation policy and implementation methods in the State's standards and Continuing Planning Process and related documents.

EPA previously took no action on the new or revised criteria for aluminum, cadmium, and zinc contained in section **20.6.4.900 I. (1) Acute and (2) Chronic Hardness-based Metals Criteria.** Based on an extensive review of the supporting documentation, we are approving the application of the hardness-dependent equation for aluminum to those waters of the State at a pH of 6.5 to 9.0 because it will yield criteria that are protective of applicable uses in waters within that pH range. However, EPA is disapproving the application of this equation in waters where the pH is below 6.5 as it may not be protective of applicable uses below that pH range.

Consistent with EPA's regulations, the previously approved 304(a) criteria for aluminum are thus the applicable water quality standards for purposes of the CWA in waters where the pH is at or below 6.5. In such cases, as the permitting authority in New Mexico, EPA will apply the previously approved 87 µg/L chronic total recoverable aluminum criterion. EPA is approving the hardness-dependent equations for both cadmium and zinc.

In acting on the State's revised water quality standards today, EPA is fulfilling its CWA Section 303(c) responsibilities. However, EPA's approval of water quality standards is considered a federal action which may be subject to the Section 7(a)(2) consultation requirements of the Endangered Species Act (ESA). EPA has initiated informal consultation under ESA Section 7(a)(2) with the U.S. Fish and Wildlife Service (USFWS) regarding our approval of certain new or revised water quality standards. EPA's approval of these standards is subject to the outcome of the ESA consultation process. Should the consultation process identify information regarding impacts on listed species or designated critical habitat that supports amending our approval, EPA will amend its approval decision for those new or revised water quality standards.

I appreciate the State's cooperative efforts to resolve these final few issues. If you need additional detail concerning this letter or the enclosed addendum to our original Record of Decision, please call me at (214) 665-3187, or have your staff may contact Russell Nelson at (214) 665-6646.

Sincerely,

William K. Honker, P.E.
Acting Director
Water Quality Protection Division

Enclosure

cc: James Hogan
Surface Water Quality Bureau
P.O. Box 5469
New Mexico Environment Department

Wally Murphy
Field Supervisor
Ecological Services Office
USFWS
2105 Osuna Road NE
Albuquerque, NM 87113-1001

UNITED STATES ENVIRONMENTAL PROTECT
REGION 8
1595 Wynkoop Street
DENVER, CO 80202-1129
Phone 800-227-8917
http://www.epa.gov/region08

West Virginia Coal Association
2014 Triennial Review Comments
October 12, 2012
Attachment "B"

Ref: 8EPR-EP

AUG 04 2011

Peter Butler, Chair
Water Quality Control Commission
4300 Cherry Creek Drive South
Denver, CO 80222-1530

Subject: 2010 Revisions to the Basic Standards and Methodologies for Surface Waters

Dear Mr. Butler:

The purpose of this letter is to notify you of the status of the U.S. Environmental Protection Agency Region 8 (EPA) review of the revisions to the Basic Standards and Methodologies for Surface Waters (Regulation #31) adopted by the Colorado Water Quality Control Commission (Commission). The revisions were adopted on August 9, 2010 with an effective date of January 1, 2011. The submission letter included an Opinion of the Attorney General certifying that the standards were duly adopted pursuant to State law. Receipt of the revised standards on August 24, 2010 initiated EPA's review pursuant to Section 303(c) of the Clean Water Act (CWA or the Act) and the implementing federal water quality standards regulation (40 CFR Part 131).

EPA review of these water quality standards (WQS) revisions is complete, with the following exceptions:

- All provisions relating to discharger-specific variances, including those adopted with a January 1, 2013 delayed effective date
- Section 31.7(3)(a)(ii)(C) (Temporary Modifications)
- Section 31.8(2)(b)(i)(C) (Antidegradation)
- Molybdenum Table Value (Agriculture)
- Nitrate and Arsenic Table Values (Water Supply)

EPA's review of these revisions, and the supporting information and analyses, is nearing completion. With the exception of the provisions relating to discharger-specific variances, which were adopted with a delayed effective date, we estimate that our review of these revisions will be complete within 60 days.

We wish to commend the Standards Unit of the Water Quality Control Division (WQCD or the Division) for their outstanding work in support of this rulemaking action. Division staff developed proposed revisions, with input from the Standards Formulation stakeholder work

group, on a wide range of topics, including: antidegradation, arsenic, dissolved oxygen, *E. coli*, mercury, molybdenum, nitrate, temperature, temporary modifications, uranium, discharger-specific variances, and zinc. Developing these proposals required the Division to present information and solicit input during a series of stakeholder work group meetings during 2007-2009. In addition, the Division explained these issues to the Commission during the October 2008 issues scoping hearing, the November 2009 issues formulation hearing, and the June 2010 rulemaking hearing. The WQCD also developed detailed comments and recommendations on the aluminum, iron and zinc revisions proposed by the Colorado Mining Association (CMA), and the nonylphenol revision proposed by the Colorado Wastewater Utility Council (CWUC). Most revisions are well supported by the evidence submitted, and we wish to recognize the high caliber of work by the Standards Unit both prior to and during the rulemaking action.

CLEAN WATER ACT REVIEW REQUIREMENTS

CWA § 303(c)(2) requires States and authorized Indian Tribes to submit new and revised water quality standards to EPA for review. EPA is required to review and approve or disapprove the revised standards pursuant to CWA § 303(c)(3). The Region's goal has been, and will continue to be, to work closely and collaboratively with States and authorized Tribes throughout the standards revision process so that submitted revisions can be approved by EPA.

TODAY'S ACTION

The Region is approving the revisions to Regulation #31 adopted by the Commission on August 9, 2010, with the exception of the new and revised provisions EPA is not acting on today. The rationale for EPA's action is briefly outlined below and discussed in detail in Enclosure 1.

Today's letter applies only to water bodies in the State of Colorado, and does not apply to waters that are within Indian Country, as defined in 18 U.S.C. Section 1151. Today's letter is not intended as an action to approve or disapprove water quality standards applying to waters within Indian Country. EPA, or authorized Indian Tribes, as appropriate, will retain responsibilities for water quality standards for waters within Indian Country.

ENDANGERED SPECIES ACT REQUIREMENTS

It is important to note that EPA approval of water quality standards is considered a federal action which may be subject to the Section 7(a)(2) consultation requirements of the Endangered Species Act (ESA). Section 7(a)(2) of the ESA states that "each federal agency...shall...insure that any action authorized, funded or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined to be critical..."

EPA has initiated consultation under ESA Section 7(a)(2) with the U.S. Fish and Wildlife Service regarding our approval of certain new or revised water quality standards. EPA also has a Clean Water Act obligation, as a separate matter, to complete its water quality standards approval action. Therefore, in approving these water quality standards revisions today, EPA is

completing its CWA Section 303(c) responsibilities. However, because ESA consultation on EPA's approval of these standards is ongoing, EPA's approval is made subject to the outcome of the ESA consultation process. Should the consultation process with the U.S. Fish and Wildlife Service identify information regarding impacts on listed species or designated critical habitat that supports amending EPA's approval, EPA will, as appropriate, revisit and amend its approval decision for those new or revised water quality standards.

STANDARDS APPROVED WITHOUT CONDITION

All new and revised water quality standards in this category are approved without condition because the revisions are consistent with the requirements of the Clean Water Act and EPA's implementing regulation. New and revised provisions in this category are:

- Section 31.5. Definitions.
- Section 31.7. Overview.
- Section 31.7(1)(b)(ii). Ambient Quality-Based Standards.
- Section 31.7(3). Temporary Modifications (with exception of 31.7(3)(a)(ii)(C)).
- Section 31.14(15). Compliance schedules for discharges to segments with temporary modifications.
- Table I. (Recreation, Agriculture).
- Table III. (Water Supply).

STANDARDS APPROVED SUBJECT TO ESA CONSULTATION

All new and revised water quality standards in this category are approved, subject to ESA consultation. New and revised provisions in this category are:

- Table I. Physical and Biological Parameters (Aquatic Life).
- Table III. (Aquatic Life).

PROVISIONS EPA IS NOT ACTING ON TODAY

- All provisions relating to discharger-specific variances. New and revised provisions in this category are:
  - Section 31.7. Overview (portions that relate to discharger-specific variances).
  - Section 31.7(4). Granting, Extending and Removing Variances to Numeric Standards (Effective January 1, 2013).
  - Section 31.14 (17). Permit Actions that Implement Discharger-Specific Variances.

- Section 31.7(3)(a)(ii)(C) (Temporary Modifications). This new provision was adopted to authorize temporary modifications where "there is significant uncertainty regarding the timing of implementing attainable source controls or treatment."

- Section 31.8(2)(b)(i)(C) (Antidegradation). This revised provision was adopted to authorize Use Protected designations[1] for segments that meet the 31.5 definition of "effluent-dependent stream" or "effluent-dominated stream."

- Molybdenum Table Value (Agriculture). This provision consists of the new 300 µg/L table value standard for the protection of agriculture uses.

- Nitrate and Arsenic Table Values (Water Supply). These provisions include the revised table values for nitrate (Table II) and arsenic (Table III), as modified by the respective footnotes, that authorize the Division to exclude effluent limits from discharge permits if water supply uses are designated but not "actual."

CONCLUSION

EPA Region 8 congratulates the Commission and the Division for the many improvements to the Basic Standards and Methodologies for Surface Waters. If you have any questions concerning this letter, the most knowledgeable people on my staff are David Moon (303 312-6833) and Lareina Guenzel (303-312-6610).

Sincerely,

Carol L. Campbell

Carol L. Campbell
Assistant Regional Administrator
Office of Ecosystems Protection and Remediation

Enclosure

[1] Under Colorado's antidegradation rule, antidegradation reviews are not required for segments with a Use Protected designation.

West Virginia Coal
PO Box 3923, Charleston, WV 25339 • (304) 342-4153 • Fa
jbostic@wvcoal.com

September 21, 2011

Mr. Scott G. Mandirola, Director
Division of Water and Waste Management
WV Department of Environmental Protection
601 57th Street, S.E.
Charleston, WV 25304
Via electronic mail Scott.G.Mandirola@wv.gov

Re: 47 CSR 2, *Requirements Governing Water Quality Standards*
Request to Revise Statewide Category B Aquatic Life Criteria for Aluminum

Dear Director Mandirola:

As you are aware, the aluminum aquatic life water quality criteria in West Virginia have received considerable attention over the past twenty years. Because aluminum is a very common, naturally occurring element, many streams in the State exceed the numeric criteria for aluminum, with no corresponding signs of impairment to the aquatic life that the criteria are intended to protect.

The current national recommended aluminum criteria are set forth in the *Ambient Aquatic Life Water Quality Criteria for Aluminum*, which was published by the United States Environmental Protection Agency ("EPA") in 1988 (the "1988 Criteria"). Considerable work has been conducted regarding aluminum toxicity since the 1988 Criteria were published. Accordingly, Henthorn Environmental Services LLC ("HENV") hired GEI Consultants, Inc., ("GEI") to prepare an update to the freshwater aquatic life aluminum criteria.

GEI reviewed the scientific literature conducted since publication of the 1988 Criteria, and used the data to recommend updated criteria for protection of aquatic life derived according to USEPA guidance (USEPA 1985). The results of GEI's work are set forth in the attached report. GEI has recommended the adoption of the following hardness-based formulas for the freshwater aluminum aquatic life criteria:

Acute Criterion		Chronic Criterion	
CMC	=	FCV	=
$e^{1.3695*\ln(\text{hardness})+1.8308}$ x CF		$e^{1.3695*\ln(\text{hardness})+0.9161}$ x CF	

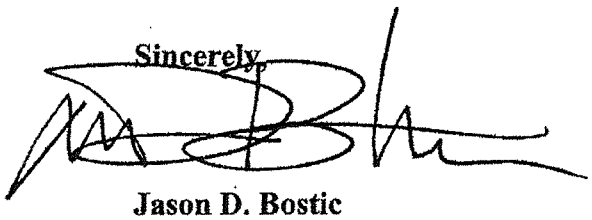
The toxicity of some metals is inversely related to water hardness. In other words, the metal's toxicity to aquatic life decreases as the water hardness increases. The United States Environmental Protection Agency ("EPA") has developed hardness-dependent equations for a number of metals to reflect this relationship. West Virginia has adopted EPA's hardness-dependent equations for cadmium, trivalent chromium, copper, lead, nickel, silver, and zinc. The hardness-based criteria developed by GEI for aluminum follow the same approach used by EPA for other metals.

Importantly, GEI has been involved in similar efforts to revise the aluminum criteria in New Mexico and Colorado. New Mexico has recently adopted the same hardness-based formulas presented by GEI in the attached report, and is awaiting EPA's approval of its revised aluminum water quality criteria. Colorado recently adopted the same acute hardness equation and a slightly modified version of the chronic hardness equation, and has received EPA approval.

Currently, West Virginia has a separate chronic aluminum criterion for Category B2 (trout) streams of 87 ug/l. This chronic criterion was based upon a single study conducted at an extremely low hardness concentration. GEI has considered and included this study in its report, and the hardness-based equations developed are protective of all Category B freshwater uses, including trout streams.

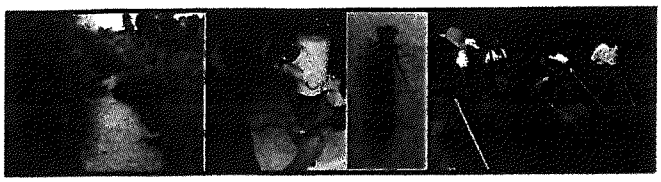
Thank you for your attention to this matter. If you have any questions, please contact me.

Sincerely,



Jason D. Bostic
Vice-President

cc: **Randy C. Huffman, Cabinet Secretary**
Kristin Boggs, General Counsel
Thomas L. Clarke, Director, Division of Mining & Reclamation
Kevin R. Coyne, Assistant Director



GEI Consultants

Geotechnical
Environmental
Water Resources
Ecological

Updated Freshwater Aquatic Life Criteria for Aluminum

Submitted to:
Henthorn Environmental Services, LLC
517 Sixth Avenue
St. Albans, WV 25177

Submitted by:
GEI Consultants, Inc.
Ecological Division
4601 DTC Boulevard, Suite 900
Denver, CO 80237

August 2011
Project 114210

Table of Contents

1.0 Introduction 1

2.0 Summary of Existing Criteria 2

3.0 Summary of New Toxicity Studies 3
3.1 Acute Toxicity 3
3.2 Chronic Toxicity 4
3.3 Other Data 9
3.4 Unused Data 9

4.0 Hardness-Toxicity Relationship 11

5.0 Revised Aluminum Criteria 13
5.1 Acute Criterion 13
5.2 Chronic Criterion 13
5.3 Protectiveness of the Chronic Criterion to Brook Trout and Striped Bass 15
5.3.1 Brook Trout 15
5.3.2 Striped Bass 16

6.0 Criteria Statement 17

7.0 References 18

List of Figures

Figure 1: Relationship between hardness and acute aluminum toxicity.

List of Tables

Table 1a: Acute toxicity of aluminum to aquatic animals.
Table 1b: Results of covariance analysis of freshwater acute toxicity versus hardness.
Table 1c: List of studies used to estimate acute aluminum hardness slope.
Table 2a: Chronic toxicity of aluminum to aquatic animals.
Table 2b: Aluminum acute-chronic ratios.
Table 3: Ranked genus mean acute values with species mean acute-chronic ratios

List of Acronyms

ACR	acute-chronic ratio
Al	aluminum
AWQC	ambient water quality criteria
CCC	criterion continuous concentration (chronic criterion)
CMC	criterion maximum concentration (acute criterion)
EC_{50}	median effect concentration –point estimate for 50% effect
FACR	final ACR
FAV	final acute value
FCV	final chronic value
GMAVs	genus mean acute values
LC_{50}	median lethal concentration –point estimate for 50% lethality
LOEC	lowest observed effect concentration
SMAVs	species mean acute values
USEPA	U.S. Environmental Protection Agency

1.0 Introduction

The current ambient water quality criteria (AWQC) for aluminum (Al) were released in 1988 (USEPA 1988). Background information on Al chemistry in freshwater systems can also be found in USEPA (1988) and in Sposito (1996). Of particular importance in deriving AWQC for Al is the pH of the water used in toxicity tests. Between a pH of 6.5 and 9.0, Al occurs largely as poorly soluble polymeric hydroxides and as complexes with humic acids, phosphate, sulfate, and other anions (USEPA 1988; Sposito 1996). Waters with a pH <6.5 are below the acceptable pH range identified by the USEPA, and such waters favor the dissolution of Al into more bioavailable monomeric and ionic forms. Consistent with the USEPA's existing criteria for Al, the updated Al criteria recommended here only consider toxicity studies conducted within the pH range of 6.5 to 9.0, and thus should only apply to surface waters with pH levels within this range.

This report reviews the scientific literature conducted since publication of the 1988 AWQC for Al, and uses these data to recommend updated criteria for protection of aquatic life derived according to USEPA guidance (USEPA 1985). Section 2 of this report summarizes the basis of the existing Al criteria and then Section 3 summarizes additional Al toxicity studies published after release of the 1988 AWQC document. Sections 4-6 then use these data to recommend updates to freshwater aquatic life criteria for Al in a format that is consistent with USEPA guidance.

2.0 Summary of Existing Criteria

The USEPA's current acute and chronic criteria for protection of aquatic life are 750 and 87 µg/L, respectively. Development of these criteria followed the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (USEPA 1985). Specifically, the USEPA identified acute LC_{50} values for 15 aquatic species, which resulted in the calculation of 15 species mean acute values (SMAVs)[1]. These 15 SMAVs represented 14 genera, which resulted in the calculation of 14 genus mean acute values (GMAVs)[2]. The 5th percentile of these GMAVs, or final acute value (FAV), was calculated to be 1,496 µg/L. Division of the FAV by two resulted in an acute criterion (termed the criterion maximum concentration, or CMC) of 750 µg/L. Because limited chronic Al toxicity data were available, the final chronic value (FCV) was calculated using an acute-chronic ratio (ACR). The USEPA identified ACRs of 0.9958, 10.64, and 51.47. Because the two highest ACRs were based on acutely insensitive species, these were not considered in development of the final ACR (FACR). However, because the remaining ACR of 0.9958 was less than 2, the USEPA (1985) guidelines required that the FACR be set to 2, otherwise the chronic criterion would be higher than the acute criterion. This results in a FCV of 750 µg/L (equivalent to the CMC). Finally, the USEPA (1988) considered "other data" that were considered scientifically sound, but were from studies that did not strictly meet the guidelines for calculation of the FCV. From the "other data" cited in USEPA (1988), adverse effects were reported for two "important" species at Al concentrations below the FCV of 750 µg/L: (1) a 24 percent reduction in weight of young brook trout (*Salvelinus fontinalis*) was observed at an Al concentration of 169 µg/L (Cleveland et al. Manuscript) and (2) 58 percent striped bass (*Morone saxatilis*) mortality occurred at an Al concentration of 174.4 µg/L (Buckler et al. Manuscript). Aluminum concentrations of 88 and 87.2 µg/L from these same two studies resulted in negligible toxicity. Accordingly, the USEPA set the chronic criterion, or criterion continuous concentration (CCC), at 87 µg/L.

Since the release of the current AWQC for Al in 1988, several acute and chronic Al toxicity studies have been published in the scientific literature. Many of these toxicity studies meet the USEPA (1985) guidelines for AWQC development and also result in additional data for deriving an Al ACR. As discussed below, there is also evidence that the toxicity of Al to aquatic life is hardness-dependent (i.e., Al toxicity is greater in softer waters and decreases as water hardness increases).

[1] The species mean acute value, or SMAV, is the geometric mean of acute LC_{50} values for a single species.
[2] The genus mean acute value, or GMAV, is the geometric mean of SMAVs for a single genus.

3.0 Summary of New Toxicity Studies

The USEPA (1985) guidelines for AWQC development specify minimum study requirements for consideration in the development of acute and chronic criteria for protection of aquatic life. For example, acute toxicity studies must have an exposure duration of 96 hours (although 48 hours is acceptable for more short-lived species, such as cladocerans and midges), organisms must not be fed during the study, and the endpoint must be mortality, immobilization or a combination of the two. Chronic toxicity studies must be conducted using exposure durations that encompass the full life cycle or, for fish, early life stage and partial life cycle studies are acceptable. In addition, toxicant concentrations in the exposure solutions must be analytically verified in chronic studies. Finally, under the USEPA (1985) guidelines, toxicity studies that do not meet the specific study requirements may still be retained as "other data" if the study was otherwise scientifically valid. Such "other data" are not used in the calculation of the CMC and FCV, but may be used to justify lowering the acute or chronic criteria for a toxicant if the species and endpoint tested are considered to be "biologically or recreationally important," and if the CMC or FCV were determined to be inadequately protective of these species or endpoints. For Al, "other data" were used to lower the FCV in development of the chronic criterion, as discussed in Section 2.

The following summarizes the Al toxicity data published since 1988 that are considered acceptable for updating the Al criteria. Our primary source for these new data was a study conducted on behalf of the *Arid West Water Quality Research Project* (AWWQRP 2006), in which a thorough literature review was conducted, and recommendations made for updating aquatic life criteria. While the studies used in the present report are, for the most part, the same as those used in AWWQRP (2006), we recommend different final criteria equations to maximize consistency with USEPA guidance for derivation of aquatic life criteria (USEPA 1985).

3.1 Acute Toxicity

As summarized in Section 2, the acute Al toxicity database used to derive the current acute Al criterion was based on 14 GMAVs, which in turn was based on 15 SMAVs. The updated acute Al toxicity database includes seven additional species with tests considered to be of an acceptable type and duration according to USEPA (1985):

- *Asellus aquaticus*, isopod (Martin and Holdich 1986)
- *Crangonyx pseudogracilis*, amphipod (Martin and Holdich 1986)
- *Cyclops viridis*, copepod (Storey et al. 1992)
- *Gammarus pulex*, amphipod (Storey et al. 1992)
- *Tubifex tubifex*, worm (Khangarot 1991)
- *Hybognathus amarus*, Rio Grande silvery minnow (Buhl 2002)
- *Salmo salar*, Atlantic salmon (Hamilton and Haines 1995)

This results in acute Al toxicity data for a total of 22 species representing 19 genera. In addition, new acute toxicity studies were identified for several species already included in the 1988 AWQC, including the cladoceran *Ceriodaphnia dubia* (ENSR 1992a; Soucek et al. 2001), rainbow trout (*Oncorhynchus mykiss*) (Thomsen et al. 1988; Gundersen et al. 1994), and fathead minnow (*Pimephales promelas*) (Buhl 2002; ENSR 1992b). All acceptable acute LC_{50} and EC_{50} values for Al are summarized in Table 1a.

3.2 Chronic Toxicity

The 1988 AWQC for Al included chronic toxicity data for three species: (1) the cladoceran *C. dubia*; (2) the cladoceran *Daphnia magna*; and (3) the fathead minnow *P. promelas*. As part of this update, a chronic EC16 for reproductive effects in *D. magna* (Biesinger and Christensen 1972) was added to the chronic toxicity data set. The chronic toxicity value from Biesinger and Christensen (1972) was likely excluded in USEPA (1988) because Al test concentrations were not analytically verified. However, this study is included here because the chronic value is consistent with the corresponding measured value from the Kimball manuscript, thus reducing some of the uncertainty associated with the Al concentrations not being analytically verified. This study also provides additional useful information for deriving an ACR, as discussed further below. No additional chronic toxicity studies were identified that meet the USEPA's guidelines (i.e., life cycle study or an early life stage or partial life cycle study for fish). All acceptable chronic toxicity studies are summarized in Table 2a.

A total of four ACRs were derived: 0.9958 and 0.9236 for *C. dubia*, 12.19 and 51.47 for *D. magna*, and 10.64 for fathead minnows (Table 2b). It is uncertain why the *D. magna* ACR of 51.47 is considerably higher than the other ACRs, including the other *D. magna* ACR of 12.19. However, the combination of the high hardness (220 mg/L) and pH (8.30) would likely have mitigated the toxicity of Al compared to waters with a hardness of 45.3 mg/L and pH of 6.5-7.5 used in tests to derive the *D. magna* ACR of 12.19 from Biesinger and Christensen (1972). Therefore, it is more appropriate to select an ACR from tests conducted under conditions that likely maximize Al toxicity. The *D. magna* acute values from the two studies differed by a factor of 10, but the chronic values differed by just a factor of two (Table 2b). Because the *D. magna* ACR of 51.47 is driven by an insensitive acute value under high hardness and high pH conditions, this value was excluded from the final ACR. Calculating the geometric mean of the remaining ACRs results in a final ACR of 4.9923.

In USEPA (1988), it was noted that a Final Plant Value, as defined in USEPA (1985), was not obtained because there were no plant toxicity studies conducted with an important aquatic plant species in which Al was measured and in which the endpoint measured was biologically important. No new published algal or aquatic plant studies have been obtained, so this conclusion has not changed for the present update.

Table 1a: Acute toxicity of aluminum to aquatic animals.

Species Latin Name	Species Common Name	Method	Chemical	pH	Hardness (mg/L as $CaCO_3$)	LC_{50} or EC_{50} (µg Al/L)	LC_{50} or EC_{50} Adjusted to Hardness of 50 mg/L (µg Al/L)	Species Mean Acute Value at Hardness of 50 mg/L (µg Al/L)	Reference
Acroneuria sp.	Stonefly	S,M	$AlCl_3$	7.46	47.4	>22,600	**>24,315**	>24,315	Call 1984
Asellus aquaticus	Isopod	S,U	$Al_2(SO_4)_3$	6.75	50	4,370	**4,370**	4,370	Martin and Holdich 1986
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	7.42	50	1,900	**1,900**	>2,164	McCauley et al. 1986
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	7.86	50	1,500	**1,500**	-	McCauley et al. 1986
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	8.13	50	2,560	**2,560**	-	McCauley et al. 1986
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	7.5	26	720	**1,763**	-	ENSR 1992a
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	7.6	46	1,880	**2,107**	-	ENSR 1992a
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	7.8	96	2,450	**1,003**	-	ENSR 1992a
Ceriodaphnia dubia	Cladoceran	S,M	$AlCl_3$	8.1	194	>99,600	**>15,554**	-	ENSR 1992a
Ceriodaphnia dubia	Cladoceran	S,M	-	7.6	98.5	2,880	**1,138**	-	Soucek et al. 2001
Ceriodaphnia sp.	Cladoceran	S,M	$AlCl_3$	7.36	47.4	2,300	**2,475**	3,134	Call 1984
Ceriodaphnia sp.	Cladoceran	S,M	$AlCl_3$	7.68	47.4	3,690	**3,970**	-	Call 1984
Crangonyx pseudogracilis	Amphipod	S,U	$Al_2(SO_4)_3$	6.75	50	9,190	**9,190**	9,190	Martin and Holdich 1986
Cyclops viridis	Copepod	S,U	Al_2O_3	6.9	-	>27,000	**-**	-	Storey et al. 1992
Daphnia magna	Cladoceran	S,M	$Al_2(SO_4)_3$	7.05	220	38,200	**5,022**	4,735	Kimball manuscript
Daphnia magna	Cladoceran	S,M	$AlCl_3$	7.61	45.4	>25,300	>28,875	-	Brooke et al. 1985
Daphnia magna	Cladoceran	S,U	$AlCl_3$	7	45.3	3,900	**4,465**	-	Biesinger and Christensen 1972
Dugesia tigrina	Flatworm	S,M	$AlCl_3$	7.48	47.4	>16,600	**>17,859**	>17,859	Brooke et al. 1985
Gammarus pulex	Amphipod	S,M	Al_2O_3	6.9	-	>2,700	**-**	-	Storey et al. 1992
Gammarus pseudolimnaeus	Amphipod	S,M	$AlCl_3$	7.53	47.4	22,000	**23,669**	23,669	Call 1984
Physa sp.	Snail	S,M	$AlCl_3$	7.46	47.4	55,500	59,711	32,922	Call 1984
Physa sp.	Snail	S,M	$AlCl_3$	6.59	47.4	>23,400	>25,175	-	Call 1984
Physa sp.	Snail	S,M	$AlCl_3$	7.55	47.4	30,600	**32,922**	-	Call 1984
Physa sp.	Snail	S,M	$AlCl_3$	8.17	47.4	>24,700	>26,574	-	Call 1984
Tanytarsus dissimilis	Midge	S,U	$Al_2(SO_4)_3$	6.85-7.71	17.43	>79,900	**>338,321**	>338,321	Lamb and Bailey 1981
Tubifex tubifex	Worm	R,U	$Al(NH_4SO_4)_2$	7.6	245	50,230	**5,698**	5,698	Khangarot 1991
Hybognathus amarus	Rio Grande silvery minnow	S,M	$AlCl_3$	8.1	140	>59,100	**>14,428**	>14,428	Buhl 2002

Species Latin Name	Species Common Name	Method	Chemical	pH	Hardness (mg/L as $CaCO_3$)	LC_{50} or EC_{50} (µg Al/L)	LC_{50} or EC_{50} Adjusted to Hardness of 50 mg/L (µg Al/L)	Species Mean Acute Value at Hardness of 50 mg/L (µg Al/L)	Reference
Ictalurus punctatus	Channel catfish	S,M	$AlCl_3$	7.54	47.4	>47,900	**>51,534**	>51,534	Call 1984
Lepomis cyanellus	Green sunfish	S,M	$AlCl_3$	7.55	47.4	>50,000	**>53,794**	>53,794	Call 1984
Oncorhynchus mykiss	Rainbow trout	S,M	$AlCl_3$	6.59	47.4	7,400	**7,961**	>7,547	Call 1984
Oncorhynchus mykiss	Rainbow trout	S,M	$AlCl_3$	7.31	47.4	14,600	**15,708**	-	Call 1984
Oncorhynchus mykiss	Rainbow trout	S,M	$AlCl_3$	7.46	47.4	8,600	9,253	-	Call 1984
Oncorhynchus mykiss	Rainbow trout	S,M	$AlCl_3$	8.17	47.4	>24,700	>26,574	-	Call 1984
Oncorhynchus mykiss	Rainbow trout	F,M	$AlCl_3$	8.25	23.2	6,170	**17,660**	-	Gundersen et al. 1994
Oncorhynchus mykiss	Rainbow trout	F,M	$AlCl_3$	8.25	35	6,170	**10,056**	-	Gundersen et al. 1994
Oncorhynchus mykiss	Rainbow trout	F,M	$AlCl_3$	8.29	83.6	7,670	**3,794**	-	Gundersen et al. 1994
Oncorhynchus mykiss	Rainbow trout	F,M	$AlCl_3$	8.29	115.8	6,930	**2,194**	-	Gundersen et al. 1994
Oncorhynchus tshawytscha	Chinook salmon	S,M	$NaAlO_2$	7	28	>40,000	**>88,495**	>88,495	Peterson et al. 1974
Perca flavescens	Yellow perch	S,M	$AlCl_3$	7.55	47.4	>49,800	**>53,578**	>53,578	Call 1984
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	8.1	140	>59,100	>14,428	>5,869	Buhl 2002
Pimephales promelas	Fathead minnow	S,M	$Al_2(SO_4)_3$	7.34	220	35,000	**4,601**	-	Kimball manuscript
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	7.61	47.4	>48,200	>51,857	-	Call 1984
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	8.05	47.4	>49,800	>53,578	-	Call 1984
Pimephales promelas	Fathead minnow	S,U	$Al_2(SO_4)_3$	7.6	-	>18,900	-	-	Boyd 1979
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	7.8	26	1,160	**2,840**	-	ENSR 1992b
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	7.6	46	8,180	**9,170**	-	ENSR 1992b
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	8.1	96	20,300	**8,308**	-	ENSR 1992b
Pimephales promelas	Fathead minnow	S,M	$AlCl_3$	8.1	194	44,800	**6,996**	-	ENSR 1992b
Salmo salar	Atlantic salmon	S,M	$AlCl_3$	6.5	6.8	599	**9,2051**	9,205	Hamilton and Haines 1995
Salvelinus fontinalis	Brook trout	F,M	$Al_2(SO_4)_3$	6.5	-	3,600	-	-	Decker and Menendez 1974

* Bold, underlined values were used to calculate species mean acute values.

S = static, R = renewal, F = flow-through, U = unmeasured, M = measured

Table 1b: Results of covariance analysis of freshwater acute toxicity versus hardness.

Species	N	Slope	R^2 Value	95% Confidence Limits	Degrees of Freedom
Ceriodaphnia dubia	8	2.0674	0.751	0.8770, 3.2578	6
Daphnia magna	2	1.4439	-	-	0
Fathead minnow	5	1.5298	0.903	0.6082, 2.4514	3
All of the above	15	1.7125	0.805	1.2071, 2.2179	12

Table 1c: List of studies used to estimate acute aluminum hardness slope.

Species	Hardness (mg/L)	LC_{50} or EC_{50} (µg Al/L)	Reference
Ceriodaphnia dubia	26	720	ENSR 1992a
	46	1,880	ENSR 1992a
	50	1,500	McCauley et al. 1986
	50	1,900	McCauley et al. 1986
	50	2,560	McCauley et al. 1986
	96	2,450	ENSR 1992a
	98.5	2,880	Soucek et al. 2001
	194	>99,600	ENSR 1992a
Daphnia magna	45.3	3,900	Biesinger and Christensen 1972
	220	38,200	Kimball Manuscript
Fathead minnow	26	1,160	ENSR 1992b
	46	8,180	ENSR 1992b
	96	20,300	ENSR 1992b
	194	44,800	ENSR 1992b
	220	35,000	Kimball Manuscript

Table 2a: Chronic toxicity of aluminum to aquatic animals.

Species Latin Name	Species Common Name	Test	Chemical	pH	Hardness (mg/L as $CaCO_3$)	Limits (µg Al/L)	Chronic Value (µg Al/L)	Reference
Ceriodaphnia dubia	Cladoceran	LC	$AlCl_3$	7.15	50	1,400-2,600	1,908	McCauley et al. 1986
Ceriodaphnia dubia	Cladoceran	LC	$AlCl_3$	7.75	50	1,100-2,400	1,624	McCauley et al. 1986
Ceriodaphnia dubia	Cladoceran	LC	$AlCl_3$	7.55	47.4	4,900-12,100	7,700	Call 1984
Daphnia magna	Cladoceran	LC	$Al_2(SO_4)_3$	8.30	220	540-1,020	742.2	Kimball manuscript
Daphnia magna	Cladoceran	LC	$AlCl_3$	6.5-7.5	45.3	-	320[a]	Biesinger and Christensen 1972
Pimephales promelas	Fathead minnow	ELS	$Al_2(SO_4)_3$	7.24-8.15	220	2,300-4,700	3,288	Kimball manuscript

[a] This value is an EC_{16} for reproductive effects. It was included in Table 6 ("Other Data") of USEPA (1988), presumably because Al concentrations were not measured. However, it was included in Table 2 of this updated criteria evaluation because it provides information on the chronic sensitivity of *D. magna* in water of a moderate hardness (45.3 mg/L) and the result seems reasonable in comparison to the chronic value of 742.2 µg/L at a hardness of 220 mg/L (Kimball manuscript).

Table 2b: Aluminum acute-chronic ratios.

Species Latin Name	Species Common Name	pH	Hardness (mg/L as CaCO3)	Acute Value (µg Al/L)	Chronic Value (µg Al/L)	Acute-Chronic Ratio	Species Mean Acute-Chronic Ratio
Ceriodaphnia dubia	Cladoceran	7.15	50	1,900	1,908	0.9958	0.9590
Ceriodaphnia dubia	Cladoceran	7.75	50	1,500	1,624	0.9236	-
Daphnia magna	Cladoceran	8.30	220	38,200	742.2	51.47	-
Daphnia magna	Cladoceran	6.5-7.5	45.3	3,900	320	12.19	12.19[a]
Pimephales promelas	Fathead minnow	7.24-8.15	220	35,000	3,288	10.64	10.64
						Final ACR:	**4.9923**

[a] The acute-chronic ratio of 51.47 for *D. magna* was excluded from the species mean acute-chronic ratio because it was approximately 50 times higher than that observed for *C. dubia* and the acute-chronic ratio of 12.19 is more consistent with that observed for *P. promelas*.

3.3 Other Data

Within the pH range 6.5 – 9.0, only two other studies have been published after the 1988 Al AWQC were released, but that were not already considered to be acceptable for use in deriving the updated FAV or FCV: (1) a rainbow trout study by Thomsen et al. (1988) and (2) an Atlantic salmon study by Hamilton and Haines (1995). These are discussed below.

Thomsen et al. (1988) exposed rainbow trout (*O. mykiss*) eggs to aqueous Al concentrations in water with calcium concentrations of either 1 or 150 mg/L and a pH level of 7. The Al exposure continued through 25 days post-hatch. The LC_{50} values (measured at day 25 post-hatch) were 3,800 and 71,000 µg Al/L in waters containing calcium concentrations of 1 and 150 mg/L, respectively. The increased mortality observed in the low calcium treatment may be explained more by the low calcium treatment than by increased toxicity of Al due to higher bioavailability. As Thomsen et al. (1988) noted, the greatest reduction in survival was observed in relation to the calcium ion concentrations in the test water (survival was reduced by 24 percent in the low calcium water compared to the high calcium water without the addition of Al). Hatching time was also increased from 1.2 days in high calcium water to 4.5 days in low calcium water. Overall, this study does not meet the requirements to be included as an acceptable acute test because the exposure duration ranged from approximately 26-30 days, or as an acceptable chronic test because the study was not sufficient long to meet the early life stage requirements for rainbow trout tests (60 days post-hatch). Further, much of the mortality observed in the low calcium treatment appears to be a result of the low calcium concentration itself.

Hamilton and Haines (1995) exposed Atlantic salmon (*S. salar*) alevins to aqueous Al concentrations of 0 or 200 µg/L for 30 days. The test water pH was 6.5 and the hardness was 6.8 mg/L. This study does not meet the USEPA's (1985) specific requirements for a chronic study because it does not meet the definitions of an early life stage or partial life cycle study, but it does provide useful data that the USEPA would typically categorize as "other data." The mean weight of alevins exposed to 200 µg Al/L was significantly reduced ($p<0.05$) relative to the control, which results in a lowest observed effect concentration (LOEC) of <200 µg/L.

3.4 Unused Data

In AWQC documents, studies are identified that were not used or considered for AWQC development because the study was scientifically flawed or limited, or otherwise inappropriate for derivation of AWQC. For example, studies are not used if control organisms did not respond adequately (e.g., unacceptably high mortality) or if the test water contained elevated levels of other contaminants. In addition, studies are not used if the test species is not resident to North America. All of the unused studies published since the current Al criteria were derived are not summarized here, except for a brook trout

(*S. fontinalis*) study that is briefly summarized below given the importance of brook trout to the derivation of the 1988 chronic Al criterion.

Cleveland et al. (1991) exposed brook trout to an aqueous Al concentration of 303.9 µg/L for 56 days at a pH of 7.2 (fish were also exposed to Al at pH levels of 5.0 and 6.0, but these tests are not discussed here because the pH levels were <6.5). This study did not include a control, although only 1 percent mortality was observed following 56 days. It is unknown whether growth was affected, which is important since Cleveland et al. (1989) observed that growth is a more sensitive endpoint than survival for brook trout exposed to Al. Given the lack of a growth endpoint and due to the absence of a control treatment, this study was not sufficiently robust to identify either an acceptable chronic value for Al (for inclusion in Table 2a) or as information to be evaluated as "other data."

4.0 Hardness-Toxicity Relationship

Under the USEPA (1985) guidelines for AWQC development, methods are provided for adjusting criteria if it can be demonstrated that toxicity varies as a function of a given water quality parameter. The most common example is the relationship between water hardness and toxicity for several divalent metals. For example, the current acute and chronic criteria for cadmium, lead, nickel, and zinc are all hardness-dependent (i.e., the criteria concentrations increase with increasing water hardness; USEPA 2006). For Al, the existing data also suggest that toxicity increases with increasing water hardness, or with other water quality parameters that covary with hardness. Therefore, expressing updated Al criteria on the basis of a hardness equation—rather than as a single fixed value—is now warranted.

The general approach for deriving hardness-dependent criteria entails use of an analysis of covariance to derive a log-linear slope that relates standard toxicity values (e.g., LC_{50}s) to water hardness (USEPA 1985). To evaluate whether there is a significant statistical relationship between hardness and toxicity, there must be definitive acute values (i.e., undefined "less than" or "greater than" toxicity values are not used) from Al toxicity studies that expose organisms over a range of water hardness values such that the highest hardness is at least three times higher than the lowest, and the highest hardness is also at least 100 mg/L higher than the lowest. There were three species that met this minimum requirement: (1) *C. dubia*; (2) *D. magna*; and (3) fathead minnow.

For *C. dubia*, acute LC_{50}s were available at hardness levels of 26, 46, 50, 96, 98.5, and 194 mg/L (as $CaCO_3$). The LC_{50} at a hardness of 194 mg/L was >99,600 µg/L, which should not be used to derive the hardness-toxicity relationship because it is not a definitive value. However, if this test is not included in the hardness-toxicity evaluation, the range in hardness for the remaining *C. dubia* toxicity studies is 26 to 98.5 mg/L, which does not meet the requirement that the range between the lowest and highest hardness must be >100 mg/L. Nevertheless, because the *C. dubia* data clearly demonstrate a relationship between hardness and toxicity over an acceptable range of hardness values, the *C. dubia* data were included in the pooled slope, but the LC_{50} of >99,600 µg/L was excluded because it was not a definitive value.

The slope relating aluminum toxicity to water hardness was significantly different from zero ($p<0.05$) for all three species. In addition, the slopes were similar for all three with overlapping 95 percent confidence intervals. Accordingly, a final pooled slope of 1.3695 was derived based on the data for these three species. The individual slopes for each species and the pooled slope for combined species, as well as the data used to derive the pooled slopes, are provided in Tables 1b and 1c. The raw data used to define the relationship between hardness and toxicity, as well as the pooled slope, are plotted in Figure 1.

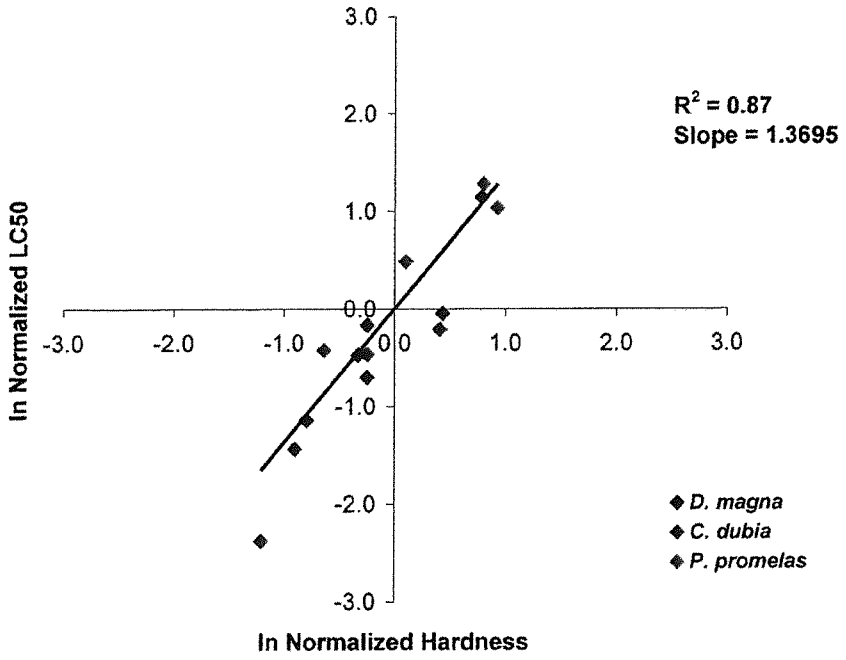


Figure 1: Relationship between hardness and acute aluminum toxicity.

5.0 Revised Aluminum Criteria

5.1 Acute Criterion

The pooled slope of 1.3695 was used to adjust the acute values in Table 1a to a hardness of 50 mg/L, except for cases where this was not possible because water hardness was not reported. Species mean acute values were calculated as the geometric mean of acceptable hardness-adjusted acute values for each species. To delineate cases in which not all toxicity values were appropriate for inclusion into a particular SMAV, the bold, underlined LC_{50} and EC_{50} values in Table 1a were ultimately used to derive the SMAVs. The SMAVs, adjusted to a hardness of 50 mg/L, ranged from >2,164 µg/L for the cladoceran *Ceriodaphnia dubia* to >338,321 µg/L for the midge *Tanytarsus dissimilis*. Genus mean acute values were calculated as the geometric mean of SMAVs and ranked from high to low (Table 3). The total number of GMAVs was 17 and the four lowest GMAVs were used to calculate the FAV following the USEPA (1985) guidelines. The FAV, at a hardness of 50 mg/L, was calculated to be 2,648 µg/L (Table 3). The FAV was then divided by two, resulting in a CMC, or acute criterion, of 1,324 µg/L at a hardness of 50 mg/L. The resulting equation for deriving the CMC over a range of hardness levels is:

$$CMC = e^{(1.3695[\ln(hardness)]+1.8308)} \qquad \textbf{Eq. 1}$$

The hardness relationship was derived based on empirical data within a hardness range of 26 to 220 mg/L, so application of this equation to hardness levels outside of this range should be treated with caution.

5.2 Chronic Criterion

Chronic Al toxicity values did not meet the minimum data requirements for calculating the FCV as the 5th percentile of empirically derived chronic values. Accordingly, it was necessary to apply an ACR to the FAV (consistent with the calculation of the FCV for Al in USEPA [1988]). At a hardness of 50 mg/L, division of the FAV of 2,648 µg/L (see Section 5.1) by the final ACR of 4.9923 (see Section 3.2) results in a FCV of 530 µg/L (Table 3). The resulting equation for deriving the FCV over a range of hardness levels is:

$$FCV = e^{(1.3695[\ln(hardness)]+0.9161)} \qquad \textbf{Eq. 2}$$

Similar to the acute hardness equation, because the hardness relationship was derived based on empirical data within a hardness range of 26 to 220 mg/L, application of this equation to hardness levels outside of this range should be treated with caution.

Table 3: Ranked genus mean acute values with species mean acute-chronic ratios

Rank	Genus Mean Acute Value (µg Al/L)	Species	Species Mean Acute Value (µg Al/L)	Species Mean Acute-Chronic Ratio
17	>338,321	*Tanytarsus dissimilis* (midge)	>338,321	-
16	>53,794	*Lepomis cyanellus* (green sunfish)	>53,794	-
15	>53,578	*Perca flavescens* (yellow perch)	>53,578	-
14	>51,534	*Ictalurus punctatus* (channel catfish)	>51,534	-
13	32,922	*Physa* sp. (snail)	32,922	-
12	>24,315	*Acroneuria* sp. (stonefly)	>24,315	-
11	23,669	*Gammarus pseudolimnaeus* (amphipod)	23,669	-
10	>18,189	*Dugesia tigrina* (flatworm)	>18,189	-
9	>14,428	*Hybognathus amarus* (Rio Grande silvery minnow)	>14,428	-
8	9,205	*Salmo salar* (Atlantic salmon)	9,205	-
7	9,190	*Crangonyx pseudogracilis* (amphipod)	9,190	-
6	>7,547	*Oncorhynchus mykiss* (rainbow trout)	>7,547	-
		Oncorhynchus tshawytscha (chinook salmon)	>88,495*	-
5	>5,869	*Pimephales promelas* (fathead minnow)	>5,869	10.64
4	5,698	*Tubifex tubifex* (worm)	5,698	-
3	4,735	*Daphnia magna* (cladoceran)	4,735	12.19
2	4,370	*Asellus aquaticus* (isopod)	4,370	-
1	>2,604	*Ceriodaphnia dubia* (cladoceran)	>2,164	0.9590
		Ceriodaphnia sp. (cladoceran)	3,134	-

* SMAV for chinook salmon excluded from the GMAV for *Oncorhynchus*. See text for details.

Acute Criterion:

Final Acute Value = 2,648 µg/L (calculated at a hardness of 50 mg/L from Genus Mean Acute Values)

Criterion Maximum Concentration = (2,648 µg/L) / 2 = 1,324 µg/L (at a hardness of 50 mg/L)

Pooled Slope = 1.3695 (see Table 4)

ln (Criterion Maximum Intercept) = ln (CMC) – [slope x ln(50)] = ln (1,324) – [1.3695 x ln(50)] = 1.8308

Criterion Maximum Concentration = e(1.3695[ln(hardness)] + 1.8308)

Final Acute-Chronic Ratio = 4.9923

Chronic Criterion:

Final Chronic Value = (2,648 µg/L) / 4.9923 = 530 µg/L (at a hardness of 50 mg/L)

Pooled Slope = 1.3695 (see Table 4)

ln (Final Chronic Intercept) = ln (FCV) – [slope x ln(50)] = ln (530) – [1.3695 x ln(50)] = 0.9161

Final Chronic Value = e(1.3695[ln(hardness)] + 0.9161)

5.3 Protectiveness of the Chronic Criterion to Brook Trout and Striped Bass

As discussed in Section 2, USEPA (1988) derived a FCV of 750 µg/L based on a FAV of 1,496 µg/L and an ACR of 2 (i.e., 1,496 µg/L / 2 = 750 µg/L). However, two chronic studies that did not meet strict acceptability criteria (USEPA 1985) for calculation of the FCV were ultimately considered to be important enough to warrant lowering of the FCV to ensure protection of the two species tested. Based on the Cleveland et al. and Buckler et al. manuscripts cited in the 1988 AWQC, the USEPA lowered the chronic criterion to 87 µg/L in order to ensure protection of brook trout (*Salvelinus fontinalis*) and striped bass (*Morone saxatilis*). The following briefly summarizes these studies, and evaluates the level of protection that the updated criteria equations 1 and 2 would provide for these species.

5.3.1 Brook Trout

USEPA (1988), citing an unpublished Cleveland et al. manuscript (and now published as Cleveland et al. 1989), reported that Al concentrations of 169 and 350 µg/L resulted in 3 percent and 48 percent larval brook trout mortality, respectively, after a 60 day exposure, and Al concentrations of 88 and 169 µg/L resulted in a 4 percent and 24 percent reduction in weight, respectively. Following the USEPA (1985) guidelines, the chronic value from this study would typically be defined as the geometric mean of the NOEC and LOEC for the most sensitive endpoint (growth), which is 88 and 169 µg/L, respectively. The chronic value for this test would, therefore, be 122 µg/L. It should be noted that this test was conducted in very soft water with a hardness of 12.3 mg/L. Based on the hardness-toxicity slope of 1.3695, this converts to an estimated chronic value of 833 µg/L at a hardness of 50 mg/L. Given that the FCV at a hardness of 50 mg/L is 530 µg/L, this suggests that brook trout would be adequately protected by the revised criterion[3].

In addition, the GMAV of 3,600 µg Al/L for brook trout reported in Table 1a is well above the FAV of 2,648 µg Al/L (Table 3), even though water hardness was not reported in this study (Decker and Menendez 1974) and so could not be included in the FAV derivation. Finally, an additional chronic brook trout study cited in Table 6 of the 1988 AWQC (Hunn et al. 1987) reports a chronic growth reduction at 283 µg Al/L, but in extremely soft waters (0.57 mg/L hardness). It would likely not be meaningful to apply a hardness slope to such a low water hardness, but given that the chronic value from Cleveland et al. (1989) conducted in harder water was lower than that of Hunn et al. (1987), a revised chronic criterion using Equation 2 would still be considered protective. Therefore, the available toxicity data suggest that the revised chronic criteria reported here would also be protective of both chronic and acute Al toxicity to brook trout, and so the calculated FCV does not need to be lowered to protect this species.

[3] Given that the very low hardness of 12.3 mg/L is below the range of hardness levels used to develop the pooled hardness slope, there is some uncertainty associated with this evaluation.

5.3.2 Striped Bass

USEPA (1988), citing the unpublished Buckler et al. manuscript (and now published as Buckler et al. 1987), reports that Al concentrations of 87.2 and 174.4 µg/L, at a pH of 6.5, resulted in 0 percent and 58 percent mortality of 160 day-old striped bass, respectively, after a 7 day exposure. USEPA (1988) also reported that Al concentration of 174.4 and 348.8 µg/L resulted in 2 percent and 100 percent mortality in 160 day-old striped bass at a pH of 7.2 (i.e., Al was more toxic at pH 6.5 than at pH 7.2). In addition, citing the Buckler et al. manuscript, USEPA (1988) reported that an Al concentration of 390 µg/L resulted in 0 percent mortality of 159 and 195 day-old striped bass at both a pH of 6.5 and 7.2 following a 7 day exposure. These values were identical to those in the published version of the study in Buckler et al. (1987). Additional 7 day toxicity tests of younger life stages were reported in Buckler et al. (1987). However, control survival in these other studies was marginal: (1) 72-78 percent and 79 percent for 11 day old fish at a pH of 7.2 and 6.5, respectively; and (2) 80 percent and 48 percent for 13 day old fish at a pH of 7.2 and 6.5, respectively. Conversely, control mortality was 0 percent in studies with 160 day old fish at pH levels of 6.5 and 7.2. However, if it is assumed that control mortality in the range of 20-28 percent is acceptable for younger life stages, a measured Al concentration of approximately 131 µg/L was associated with 75 percent mortality in 13 day old fish at a pH of 7.2, which was significantly greater ($p<0.05$) than in the respective control that had 20 percent mortality. In another study with 11 day old fish at a pH of 7.2, survival was not significantly reduced relative to the control up to a higher Al concentration of 179 µg/L, but was significantly reduced ($p<0.05$) at an Al concentration of 358 µg/L. At a pH of 6.5, control mortality was 21 percent (compared to 26 percent in the pH 7.2 control), but survival in Al treatments ≥22 µg/L was significantly reduced ($p<0.05$) compared to the pH 7.2 control (and presumably compared to the pH 6.5 control, but this was not reported).

Overall, Al toxicity to striped bass is highly variable depending on the age of the test organism and the pH of the water (6.5 vs. 7.2). Lowest observed effect concentrations range from 22 to <393 and NOECs range from 87 to >390 (in other words, the ranges of NOECs and LOECs from the various tests substantially overlap). Even within a similar age the NOECs and LOECs are highly variable, with NOECs for 159 day old fish being >390 µg/L and LOECs for 160 day old fish being 174 to 348 µg/L. Given this variability, we suggest that the striped bass toxicity data be excluded from consideration in updating the chronic Al criterion. Nevertheless, the chronic value reported in USEPA (1988) for striped bass in soft water[4] is 123 µg/L, which, assuming a water hardness of 14 mg/L, results in a chronic value of 703 µg/L at a hardness of 50 mg/L. Therefore, the available toxicity data suggest that the revised chronic criteria reported here (530 µg/L) would also be protective of chronic Al toxicity to striped bass, and so the calculated FCV does not need to be lowered to protect this species.

[4] Buckler et al. (1987) did not report the hardness of the test water, although the authors did note that hardness was monitored. They characterized the test water as soft. The test solution was created using well water passed through a water softener, which was then treated by reverse osmosis and passed through anionic, cationic, and mixed-bed exchange resins. The alkalinity and hardness of the well water were 237 and 272 mg/L, respectively. The alkalinity of the resulting test water was 12 mg/L. If we assume that the ratio of well water-to-test water alkalinity applies to hardness, we can estimate that the hardness of the test water was approximately 14 mg/L.

6.0 Criteria Statement

The available toxicity data, when evaluated using the procedures described in the *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (USEPA 1985) indicate that, except possibly where a locally important species is unusually sensitive, freshwater aquatic life should be protected if the four-day average concentration (in µg/L) of Al does not exceed the numerical value given by $e^{(1.3695[\ln(\text{hardness})]+0.9161)}$ more than once every three years on the average, and if the 24-hour average concentration (in µg/L) does not exceed the numerical value given by $e^{(1.3695[\ln(\text{hardness})]+1.8308)}$ more than once every three years on the average. For example, at hardness levels of 50, 100, and 200 mg/L as $CaCO_3$, the four-day average Al concentrations are 530, 1,370, and 3,541 µg/L, respectively, and the 24-hour average Al concentrations are 1,324, 3,421, and 8,838 µg/L.

7.0 References

AWWQRP. 2006. Evaluation of U.S. EPA Recalculation Procedure in Arid West Effluent-dependent Waters - Final Report. Arid West Water Quality Research Project (AWWQRP), Pima County Wastewater Management Department, Tucson, Arizona.

Biesinger, K.E., and G.M. Christensen. 1972. Effects of various metals on survival, growth, reproduction, and metabolism of *Daphnia magna*. J. Fish. Res. Board Can. 29:1691-1700.

Boyd, C.E. 1979. Aluminum sulfate (alum) for precipitating clay turbidity from fish ponds. Trans. Am. Fish. Soc. 108:307-313.

Brooke, L. 1985. Memorandum to C. Stephan, U.S. Environmental Protection Agency, Duluth, MN, dated July 15, 1985. University of Wisconsin-Superior, Wisconsin.

Buckler, D.R., P.M. Mehrle, L. Cleveland, and F.J. Dwyer. 1987. Influence of pH on the toxicity of aluminum and other inorganic contaminants to east coast striped bass. Water Air Soil Pollut. 35:97-106.

Buhl, K.J. 2002. The relative toxicity of waterborne inorganic contaminants to the Rio Grande silvery minnow (*Hybognathus amarus*) and fathead minnow (*Pimephales promelas*) in a water quality simulating that in the Rio Grande, New Mexico, Study No. 2F33-9620003. Final report to U.S. Fish and Wildlife Service, Albuquerque, New Mexico.

Call, D.J. 1984. Memorandum to C. Stephan, U.S. Environmental Protection Agency, Duluth, MN, dated November 27, 1984. University of Wisconsin-Superior, Wisconsin.

Cleveland, L., E.E. Little, R.H. Wiedmeyer, and D.R. Buckler. 1989. Chronic no-observed-effect concentrations of aluminum for brook trout exposed in low-calcium, dilute acidic water. Pages 229-245 in T.E. Lewis, ed. Environmental chemistry and toxicology of aluminum. Lewis Publishers, Chelsea, Michigan. 344 pp.

Cleveland, L., D.R. Buckler, and W.G. Brumbaugh. 1991. Residue dynamics and effects of aluminum on growth and mortality in brook trout. Environ. Toxicol. Chem. 10(2):243-248.

Decker, C., and R. Menendez. 1974. Acute toxicity of iron and aluminum to brook trout. Proc. W. Virg. Acad. Sci. 46:159-167.

ENSR Consulting and Engineering. 1992a. Acute toxicity of aluminum to *Ceriodaphnia dubia* under static renewal test conditions at four levels of water hardness, 8505-092-047. Report prepared for Climax Metals Company, Golden, Colorado.

ENSR Consulting and Engineering. 1992b. Acute toxicity of aluminum to *Pimephales promelas* under static renewal test conditions at four levels of water hardness, 8505-092-047. Report prepared for Climax Metals Company, Golden, Colorado.

Gensemer, R. W., and R. C. Playle. 1999. The bioavailability and toxicity of aluminum in aquatic environments. CRC Critical Reviews in Environmental Science and Technology 29:315-450.

Gundersen, D.T., S. Bustaman, W.K. Seim, and L.R. Curtis. 1994. pH, hardness, and humic acid influence aluminum toxicity to rainbow trout (*Oncorhynchus mykiss*) in weakly alkaline waters. Can. J. Fish. Aquat. Sci. 51:1345-1355.

Hamilton, S.J., and T.A. Haines. 1995. Influence of fluoride on aluminum toxicity to Atlantic salmon (*Salmo salar*). Can. J. Fish. Aq. Sci. 52:2432-2444.

Hunn, J.B., L. Cleveland, and E.E. Little. 1987. Influence of pH and aluminum on developing brook trout in a low calcium water. Environ. Pollut. 43:63-73.

Khangarot, B.S. 1991. Toxicity of metals to a freshwater tubificid worm, *Tubifex tubifex* (Muller). Bull. Environ. Contam. Toxicol. 46:906-912.

Kimball, G. Manuscript. The effects of lesser known metals and one organic to fathead minnows (*Pimephales promelas*) and Daphnia magna.

Lamb, D.S., and G.C. Bailey. 1981. Acute and chronic effects of alum to midge larva (Diptera: Chironomidae). Bull. Environ. Contam. Toxicol. 27:59-67.

Martin, T.R., and D.M. Holdich. 1986. The acute lethal toxicity of heavy metals to peracarid crustaceans (with particular reference to fresh-water Asellids and Gammarids). Water Res. 20(9):1137-1147.

McCauley, D.J., L.T. Brooke, D.J. Call, and C.A. Lindbergh. 1988. Acute and chronic toxicity of aluminum to *Ceriodaphnia dubia* at various pHs. University of Wisconsin-Superior, Superior, Wisconsin.

Peterson, S.A., W.D. Sanville, F.S. Stay, and C.F. Powers. 1974. Nutrient inactivation as a lake restoration procedure. Laboratory investigations. EPA-660/3-74-032.

Soucek, D.J., D.S. Cherry, and C.E. Zipper. 2001. Aluminum-dominated acute toxicity to the cladoceran *Ceriodaphnia dubia* in neutral waters downstream of an acid mine drainage discharge. Can. J. Fish. Aquatic Sci. 58(12):2396-2404.

Sposito, G. 1996. The environmental chemistry of aluminum, 2nd Ed. CRC Press, Boca Raton, Florida.

Storey, D.M., F.B. Pyatt, and L.E. Broadley. 1992. An appraisal of some effects of simulated acid rain and aluminum ions on *Cyclops viridis* (Crustacea, Copepoda) and *Gammarus pulex* (Crustacea, Amphipoda). Int. J. Environ. Stud. 42:159-176.

Thomsen, A., B. Korsgaard, and J. Joensen. 1988. Effect of aluminium and calcium ions on survival and physiology of rainbow trout *Salmo gairdneri* (Richardson) eggs and larvae exposed to acid stress. Aquat. Toxicol. 12:291-300.

USEPA. 1985. Guidelines for deriving numerical national water quality criteria for the protection of aquatic organisms and their uses. United States Environmental Protection Agency, Washington, D.C. NTIS No. PB85-227049. 98 pages.

USEPA. 1988. Ambient aquatic life water quality criteria for aluminum. Office of Water, Regulations and Standards, Criteria and Standards Division. United States Environmental Protection Agency, Washington, D.C. EPA 440/5-88-008.

THE STATE WATER RESOURCES BOARD

OF

WEST VIRGINIA

RATIONALE DOCUMENT

for

Revision of Legislative Rules

Series I, II, III, and IX

January 6, 1986

With this scheme, the reader is immediately keyed to the stringency of the criterion by the descending nature of the category designation (i.e. - A = most stringent, E = least stringent). The Board made further findings that (a) classification of a water body according to a particular designated use or uses does not preclude use of the water for other purposes; (b) known specific water quality criteria corresponding to each surface water category are listed in Section 8; (c) appendices to this series contain known streams or stream segments having uses, but are to be recognized as purely representative or informational; and (d) questions concerning use categorization should be resolved based upon meeting the definition in this section.

Section 6.2

Category A - Water Supply, Public:

1. Existing Rule.

The Board's existing rule on public water supplies simply states that it is "all waters used by the public for drinking purposes and applies to water before it is treated". Also, "it does not include water for cooling". This was previously designated Category B1.

2. Proposed Change.

In observation of public health guidelines and descriptions, the Board chose to use the currently accepted Department of Health definition which outlines the types of

systems that are regulated by that agency. The State Health Department currently permits public water supplies which have "at least 15 service connections or regularly serve at least 25 individuals for a period of 60 days or more". This language was proposed by the Board. Also, in consideration of the drainage area just above a public supply intake, the Board proposed language concerning a "zone of protection". That language is as follows: "Each segment extending upstream from the intake either one-half (1/2) mile or to the headwater, whichever is the less distance shall be protected by prohibiting the discharge of any pollutants in excess of the concentrations designated for this water use category in Section 8. Those dischargers to stream segments between one half (1/2) and five (5) miles upstream of an intake must consider the fate and transport of pollutants and demonstrate upon permit application that the concentration of those pollutants will not adversely affect the potability of the water supply. This use shall apply at existing or established points of public water supply withdrawal".

3. Comments and Responses.

This proposal received in excess of ten written comments and was probably the most intensely debated issue of the current revision. Numerous comments cited that by following the definition of 15 connections and/or 25 individuals, many small-group or single, domestic users

would be unprotected. One comment noted that the Health Department recognizes and routinely tests water supplies which fall outside the proposed definition although they do not "permit" this type of facility. Several suggested inclusion of all waters used for human consumption.

Other comments were directed at application of the public health criteria and particularly the zones of protection. Comments purported that it made no regulatory sense to meet drinking water supply criteria where no intake and therefore no "use" exists. Further, suggestions wereto extend the zone of protection to 20 miles, to consider the fate and transport of heavy metals and to clarify the Board's position on the level of discharge allowed in the protection zone.

Several comments were directed at the "List of Water Supplies" contained in Appendix B of the Board's regulations. These questioned the completeness of the list and whether others could/would be added.

The Board responded to the first group of comments by agreeing that all waters actually used for human consumption should be included in the definition and therefore protected. They further agreed that defining <u>where</u> the criteria are to apply as part of the definition might be improper. Above all, they agreed that the category and criteria for public water supplies should not be applied to

streams or stream segments where no one is using the waters for drinking.

The Board agreed that some clarification of the language on discharge to the protection zone, and how this mechanism would work, might be useful.

The Board disagreed, however with comments suggesting the protection zone be increased. They had two reasons for this position: (1) the State of Virginia (our neighboring State) has long had a 5 mile zone of protection with no deleterious effects and (2) there is no scientific evidence that 20 miles is any more protective than 5 miles.

4. Board Action.

Based on the comments and detailed review, the Board approved the proposed Water Supply Public definition to read as follows: "This Category is used to describe waters which, after conventional treatment are used for human consumption. This Category includes: (1) all community domestic water systems, (2) all non community domestic water systems (i.e. hospitals, schools), (3) all private domestic water systems, and (4) all other surface water intakes where the water is used for human consumption, and shall apply to the stream segment extending upstream from the intake for a distance as defined in Section 7.1.b.2 of this Series". Since the words "conventional treatment" might be questioned, the Board added the following definition in Section 2 of this Series: "Conventional Treatment" is the

treatment of water as approved by the State Health Department to assure that the water is safe for human consumption."

Section 6.3 - Category B - Propagation and Maintenance of Fish and Other Aquatic Life:

1. Existing Rule.

(Formerly C1 and C2, proposed as D1, D2, D3 and D4)

The current Board regulation (C1) states that this category is recognized for the "propagation and maintenance of fish and other aquatic life" and "includes all waters not designated as trout waters". The C2 language refers to the Trout Water definition in Section 2 and the representative list in Section 7.71 with no descriptive terms given in this section.

2. Proposed Change.

The Board proposed to recognize the natural variability in habitats used by aquatic organisms by redefining the two existing categories into four based on habitat type and primary species composition. Categories were proposed as follows:

6.3.a - D1 - Warm Water Fishing Streams. Streams or stream segments which contain a fishable population composed overwhelmingly of warm water species. (These may be stocked with trout seasonally.)

6.3.b - D2 - Trout Waters - See Section 2.

HB 2533

WEST VIRGINIA LEGISLATURE

FIRST REGULAR SESSION, 1999

SECOND ENROLLMENT

Com. Sub. for House Bill No. 2533

(By Delegates Hunt, Compton, Jenkins, Linch, Faircloth and Riggs)

Passed March 21, 1999

In Effect from Passage

SECOND ENROLLMENT

COMMITTEE SUBSTITUTE

FOR

H. B. 2533

(BY DELEGATES HUNT, COMPTON, JENKINS,
LINCH, FAIRCLOTH AND RIGGS)

[Passed March 21, 1999; in effect from passage.]

AN ACT to amend and reenact sections one and two, article three, chapter sixty-four of the code of West Virginia, one thousand nine hundred thirty-one, as amended; all relating generally to the promulgation of administrative rules by the various executive or administrative agencies and the procedures relating thereto; legislative mandate or authorization for the promulgation of certain legislative rules by various executive or administrative agencies; authorizing various executive or administrative agencies to promulgate certain legislative rules in the form that the rules were filed in the state register; authorizing the various executive or administrative agencies to promulgate legislative rules as amended by the Legislature; authorizing various executive or administrative agencies to promulgate legislative rules with various modifications presented to and recommended by the legislative rule-making review committee; authorizing the division of environmental protection to promulgate a legislative

rule relating to carbon monoxide & ozone; authorizing the division of environmental protection to promulgate a legislative rule relating to standards of performance for new stationary sources; authorizing the division of environmental protection to promulgate a legislative rule relating to the prevention and control of emissions from hospital, medical, and infectious waste incinerators; authorizing the division of environmental protection to promulgate a legislative rule relating to the prevention and control of air pollution from hazardous waste treatment, storage or disposal facilities; authorizing the division of environmental protection to promulgate a legislative rule relating to acid rain provisions and permits; authorizing the division of environmental protection to promulgate a legislative rule relating to ambient air quality standards for sulfur oxides an particulate matter; authorizing the division of environmental protection to promulgate a legislative rule relating to emission standards for hazardous air pollutants pursuant to 40 CFR Part 63; authorizing the division of environmental protection to promulgate a legislative rule relating to the awarding of West Virginia stream partners program grants; authorizing the division of environmental protection to promulgate a legislative rule relating to West Virginia surface mining and reclamation; authorizing the division of environmental protection to promulgate a legislative rule relating to solid waste management; authorizing the division of environmental protection to promulgate a legislative rule relating to sewage sludge management; authorizing the division of environmental protection to promulgate a legislative rule relating to hazardous waste management; authorizing the division of environmental protection to promulgate a legislative rule relating to the state construction grants program; authorizing the division of environmental protection to promulgate a legislative rule relating to the pollution prevention and compliance assistance rule; authorizing the division of environmental protection to promulgate a legislative rule relating to the state water pollution control revolving fund program; and authorizing the environmental quality board to promulgate a legislative rule relating to the requirements governing water quality standards.

Be it enacted by the Legislature of West Virginia:

That sections one and two, article three, chapter sixty-four of the code of West Virginia, one thousand nine hundred thirty-one, as amended, be amended and reenacted, all to read as follows:

ARTICLE 3. AUTHORIZATION FOR BUREAU OF ENVIRONMENT TO PROMULGATE LEGISLATIVE RULES.

§64-3-1. Division of environmental protection.

(a) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the fifth day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (ambient air quality standards for carbon monoxide and ozone, 45 CSR 9), is authorized.

(b) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the fifth day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (standards of performance for new stationary sources, 45 CSR 16), is authorized.

(c) The legislative ruled filed in the state register on the third day of August, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the fifth day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (to prevent and control emissions from hospital, medical, and infectious waste incinerators, 45 CSR 24), is authorized.

(d) The legislative rule filed in the state register on the third day of August, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the fifth day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (to prevent and control air pollution from hazardous waste treatment, storage or disposal facilities, 45 CSR 25), is authorized.

(e) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, relating to the division of environmental protection (acid rain provisions and permits, 45 CSR 33), is authorized.

(f) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the twenty-second day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (ambient air quality standards for sulfur oxides and particulate matter, 45 CSR 8), is authorized.

(g) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section four, article five, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the fifth day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (emission standards for hazardous air pollutants pursuant to 40 CFR Part 63, 45 CSR 34), is authorized.

(h) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section fourteen, article thirteen, chapter twenty of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the second day of November, one thousand nine hundred ninety-eight, relating to the division of environmental protection (awarding of West Virginia stream partners program grants, 60 CSR 4) is authorized.

(i) The legislative rule filed in the state register on the thirtieth day of July, one thousand nine hundred ninety-eight, authorized under the authority of section three, article one, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the twenty-second day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (surface mining and reclamation regulations, 38 CSR 2), is authorized.

(j) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section five, article fifteen, chapter twenty-two of this code modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the seventh day of October, one thousand nine hundred ninety-eight, relating to the division of environmental protection (solid waste management, 33 CSR 1), is authorized.

(k) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section twenty, article fifteen, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the twentieth day of November, one thousand nine hundred ninety-eight, relating to the division of environmental protection (sewage sludge management, 33 CSR 2), is authorized.

(l) The legislative rule filed in the state register on the third day of August, one thousand nine hundred ninety-eight, authorized under the authority of section six, article eighteen, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the second day of October, one thousand nine hundred ninety-eight, relating to the division of environmental protection (hazardous waste management, 33 CSR 20), is authorized.

(m) The legislative rule filed in the state register on the thirtieth day of July, one thousand nine hundred ninety-eight, authorized under the authority of section six, article two, chapter twenty-two-c of this code, relating to the division of environmental protection (state construction grants program, 47 CSR 33), is authorized.

(n) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section six, article one, chapter twenty-two of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the twenty-second day of January, one thousand nine hundred ninety-nine, relating to the division of environmental protection (pollution prevention and compliance assistance rule, 47 CSR 3), is authorized.

(o) The legislative rule filed in the state register on the thirty-first day of July, one thousand nine hundred ninety-eight, authorized under the authority of section three, article two, chapter twenty-two-c of this code, modified by the division of environmental protection to meet the objections of the legislative rule-making review committee and refiled in the state register on the second day of November, one thousand nine hundred ninety-eight, relating to the division of environmental protection (state water pollution control revolving fund program, 47 CSR 31), is authorized.

(p) The legislative rules filed in the state register on the seventh day of October, one thousand nine hundred ninety-

eight, relating to the division of environmental protection (underground storage tank insurance trust fund, 33 CSR 32) are authorized.

§64-3-2. Environmental quality board.

The legislative rule filed in the state register on the third day of August, one thousand nine hundred ninety-eight, authorized under the authority of section four, article three, chapter twenty-two-b, of this code, relating to the environmental quality board (requirements governing water quality standards, 46 CSR 1), is authorized until the thirtieth day of October, 1999: *Provided,* That the environmental quality board shall review, revise and propose, within this statutory deadline, and in accordance with the provisions of chapter twenty-nine-a of this code, emergency and legislative rules to address the interpretive differences regarding the designation of category A waters and analyze the need for distance prohibitors for the policies of public drinking water intake, with the amendments set forth below:

On page fourteen, subsection 7.2.b., by following the words "contrary provision," by striking the word "numeric";

And, on page twenty, by striking-out all of subsection 8.5..

On page 14, at the end of paragraph 7.2.a.2 after the word "headwaters.)" by inserting the following:

"Until June 30, 2003, the one-half mile zone described in this section shall not apply to the Ohio River main channel (between Brown's Island and the left descending bank) between river mile points 61.0 and 63.5."

That Joint Committee on Enrolled Bills hereby certifies that the foregoing bill is correctly enrolled.

Chairman Senate Committee

Chairman House Committee

Originating in the House.

Takes effect from passage.

Clerk of the Senate

Clerk of the House of Delegates

President of the Senate

Speaker of the House of Delegates

The within approved this the 2nd day of April, 1999.

Governor

PRESENTED TO THE
GOVERNOR
Date 3/30/99
Time 3:30

WEST VIRGINIA
SECRETARY OF STATE
KEN HECHLER
ADMINISTRATIVE LAW DIVISION

West Virginia Coal Association
2014 Triennial Review Comments
October 12, 2012
Attachment "F"

Form #7

RECEIVED OCT 14 2002

Effective Date

Oct. 29, 1999

NOTICE OF AN EMERGENCY RULE

AGENCY: Environmental Quality Board TITLE NUMBER: 46 CSR 1

CITE AUTHORITY: 22B-3-4

EMERGENCY AMENDMENT TO AN EXISTING RULE: YES ☑ NO ☐

IF YES, SERIES NUMBER OF RULE BEING AMENDED: Series 1 (One)

TITLE OF RULE BEING AMENDED: Requirements Governing Water Quality Standards

IF NO, SERIES NUMBER OF RULE BEING FILED AS AN EMERGENCY:

TITLE OF RULE BEING FILED AS AN EMERGENCY:

THE ABOVE RULE IS BEING FILED AS AN EMERGENCY RULE TO BECOME EFFECTIVE AFTER APPROVAL BY SECRETARY OF STATE OR 42ND DAY AFTER FILING, WHICHEVER OCCURS FIRST.

THE FACTS AND CIRCUMSTANCES CONSTITUTING THE EMERGENCY ARE AS FOLLOWS:

Use additional sheets if necessary

Elizabeth M Chaffee
Signature

Date: Oct. 18, 1999

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM: Environmental Quality Board, Libby Chatfield, 558-4002

EMERGENCY RULE TITLE: Requirements Governing Water Quality Standards

1. Date of Filing: Oct. 18, 1999

2. Statutory authority for promulgating emergency rule:

   22B-3-4

3. Date of filing of proposed legislative rule: _____

4. Does the emergency rule adopt new language or does it amend or appeal a current legislative rule?

   Adopts new language to amend a current legislative rule.

5. Has the same or similar emergency rule previously been filed and expired?

   NO.

6. State, with particularity, those facts and circumstances which make the emergency rule necessary for the immediate preservation of public peace, health, safety or welfare:

   The proposed amendment clarifies that all waters of the State are protected by the public drinking water supply designated use category. The Board was directed to review and revise the rule to clarify the application of category A by October 30, 1999. (See #7) Passage of the emergency rule is necessary to extend the authority of the Water Quality Standards rule beyond the October 30, 1999, deadline.

7. If the emergency rule was promulgated in order to comply with a time limit established by the Code or federal statute or regulation, cite the Code provision, federal statute or regulation and time limit established therein.

WV Code §64-3-2 authorizes 46 CSR 1 until October 30, 1999, provided that the Board review, revise and propose, within this statutory deadline, and in accordance with the provisions of chapter twenty-nine-a of this code, emergency and legislative rules to address the interpretive differences regarding the designation of category A water and analyze the need for distance prohibitors for the sources of public drinking water intake(s).

8. State, with particularity, those facts and circumstances which make the emergency rule necessary to prevent substantial harm to the public interest.

The proposed language clarifies that the category A use applies to all waters of the State. Although the use category has been implemented in that way for many years, questions have arisen recently from the regulated community regarding whether this interpretation/implementation is correct and appropriate. The Board has determined that this interpretation is appropriate at this time. Additionally, the Board had determined that using the watershed approach is a valuable way of implementing the public drinking water category. The Board will review the zones of critical control in the Source Water Assessment and Protection Program prepared by the Bureau of Public Health which applies the watershed approach to the waters of the State. The Board will then implement the reassessment of this category based on those zones of critical concern.

46 CSR 1
Requirements Governing Water Quality Standards
Emergency Rulemaking
October 18, 1999

Summary of Proposed Changes

The changes proposed address the implementation of the drinking water supply use category (category A) in section 6.2 of the rule. The rule will be amended to clarify that the public drinking water supply use category applies to all waters of the state. This is not a new interpretation of this section. The Office of Water Resources of the Division of Environmental Protection has implemented the use category in this way for some time. However, the existing language in the rule does not clearly define this interpretation. The Board is therefore proposing the amendment to make this clarification.

The specific changes proposed are to remove the existing language in section 6.2 and replace it with language providing that Category A applies to all waters unless it has been specifically removed as provided in Section 7 of the rule. Additional language is proposed which provides an exemption from the manganese human health criterion above five miles of a known drinking water source. This change has been included to address concerns raised by the coal industry regarding the difficulty of meeting the manganese limit.

The Board intends that the application of category A will be revisited upon completion of the delineation of Zones of Critical Concern (ZCCs) in the Source Water Assessment and Protection Plan being implemented by the WV Bureau for Public Health. According to that plan the Bureau will delineate zones of protection in all waters to ensure that appropriate water quality is maintained in the vicinity of public drinking water intakes. Those delineations are scheduled for completion in July 2000. Upon completion, the Board will review the delineations and reconsider the application of category A waters using the ZCCs.

46 CSR 1
Requirements Governing Water Quality Standards
Emergency Rulemaking
October 18, 1999

Statement of Circumstances Requiring Proposed Amendments

In 1997, the West Virginia Legislature passed HB2533, which, among other things, approved amendments to the Water Quality Standards rule. Section 65-3-2 authorized the rule until October 31, 1999 with a proviso that the Board review, revise and propose emergency and legislative rule to address the current designation of category A waters.

The proposed language clarifies that the use category applies to all waters of the state, except where that use has been removed through legislative rulemaking and is listed in section 7.2.d of the rule. This clarified language is consistent with the current application category A by the Office of Water Resources of the Division of Environmental Protection in the National Pollutant Discharge Elimination System (NPDES) permitting program. Additional language is proposed which provides an exemption from the manganese human health criterion above five miles of a known drinking water source. This change has been included to address concerns raised by the coal industry regarding the difficulty of meeting the manganese limit.

In considering the clarification of how Category A is to apply to the state's waters, the Board looked at a number of alternatives to the current implementation protocol. After reviewing a number of options, the Board believes that applying the watershed approach is a valuable way of implementing the public drinking water category. The Board will review the Zones of Critical Concern to be delineated around drinking water intakes as outlined in the Source Water Assessment and Protection Plan prepared by the West Virginia Bureau for Public Health which applies the watershed approach to the waters of the State. The Board will then implement the reassessment of the Public A use category based on those Zones of Critical Concern. The projected completion of the delineations of the ZCC's is July of 1999. Until that time, the Board has determined that the current application of the use category to all streams of the state is appropriate in that it ensures full protection of those waters until a review of the protection zones in the SWAPP can be completed.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: 46 CSR 1 Requirements Governing Water Quality Standards

Type of Rule: ✓ Legislative ____Interpretive _____Procedural

Agency: WV Environmental Quality Board

Address: 1615 Washington Street, E., Suite 301
Charleston, WV 25311

---

1. Effect of Proposed Rule N/A

	ANNUAL		FISCAL YEAR		
	INCREASE	DECREASE	CURRENT	NEXT	THEREAFTER
ESTIMATED TOTAL COST	$	$	$	$	$
PERSONAL SERVICES					
CURRENT EXPENSE					
REPAIRS & ALTERNATIONS					
EQUIPMENT					
OTHER					

2. Explanation of above Estimates:

N/A

3. Objectives of these rules:

Proposed changes clarify the application of category A, the public drinking water supply use designation in the Water Quality Standards Rule.

Rule Title: Requirements Governing Water Quality Standards.

4. Explanation of Overall Economic Impact of Proposed Rule.

A. Economic Impact on State Government.

None. The amendments clarify the existing implementation protocol employed by the Division of Environmental Protection.

B. Economic Impact on Political Subdivisions; Specific Industries; Specific groups of Citizens.

No changes in the permitting process will occur as a result of the proposed changes. NPDES permits will continue to include discharge limits based on use category A requirements where applicable.

C. Economic Impact on Citizens/Public at Large.

Retaining Statewide application of category A will ensure protection of States waters with a watershed approach as outlined in the West Virginia Bureau for Public Health's Source Water Assessment and Protection Program can be implemented.

Date: 8-18-1999

Signature of Agency Head or Authorized Representative

Elizabeth M Chaffee

Executive Office
#10 McJunkin Road
Nitro, WV 25143-2506
Telephone No: (304)759-0575
Fax No: (304)759-0526

West Virginia Bureau of Environment

Cecil H. Underwood
Governor

Michael C. Castle
Commissioner

October 18, 1999

Ms. Judy Cooper
Director, Administrative Law
Division
Secretary of State's Office
Capitol Complex
Charleston, WV 25305

RE: 46CSR1 - "Requirements Governing Water Quality Standards"

Dear Ms. Cooper:

WV Code §29A-3-11(a) requires the Secretary of the executive department which administers an agency under WV Code §5F-2-1, et seq., to take the necessary steps to submit rules finalized by the agencies which it administers to the legislative rulemaking process. Because I am charged with providing administrative support to the Environmental Quality Board pursuant to WV Code §5F-2-1(a)(3)(C), I hereby submit, as notice of an emergency rule, the enclosed ruelmaking package prepared by the Environmental Quality Board entitled "Requirements Governing Water Quality Standards." In my capacities both as Commission of the Bureau of Environment and Director of Environmental Protection, though, I take no position on the appropriateness or need for the rule, and note that it is more stringent than the parallel federal rules concerning the designation of stream uses.

Should you have any questions, please feel free to contact me at 759-0515, or Libby Chatfield, Technical Advisor, Environmental Quality Board at 558-4002.

Sincerely,

Michael C. Castle

Michael C. Castle
Commissioner

MCC:cc

cc: Libby Chatfield
Carrie Chambers

UNITED STATES ENVIRONMENTAL PROTECTION AGE
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

West Virginia Coal Association
2014 Triennial Review Comments
October 12, 2012
Attachment "G"

FEB 16 2000

Senator William R. Wooton, Chair
Senate Judiciary Committee
1900 Kanawha Boulevard East
Building 1, Room 210W
Charleston, WV 25305

Dear Mr. Wooton:

The Environmental Protection Agency (EPA) understands that the Environmental Quality Board (EQB) has proposed to designate all waters of West Virginia as public drinking water supply ("Category A"). In addition, while we have not been provided with a specific proposal for the future removal of the public water supply designated use on certain streams, we understand that this is being given consideration in West Virginia. EPA Region III has been asked how we would view future determinations to remove the public drinking water supply designation on a statewide or case-by-case basis in the event that such a revision may be justified.

EPA has not developed national guidance for assessing the public water supply use designation, and EPA cannot state in advance what its position would be regarding a future attempt to remove this use designation with respect to any particular water or waters. In order to assist your deliberations, this letter describes generally the process which may be required for a State to remove this designation.

Section 303(c)(2)(A) of the Clean Water Act (CWA) requires States to consider a water body's "use and value for public water supplies..." when establishing water quality standards, and thus allows for the designation of offstream uses such as public water supplies that are not included in the Section 101(a)(2) goals (i.e., "fishable/swimmable"). Generally, to change a designated use to a less stringent use, the State must provide a structured scientific assessment of the factors affecting the attainment of the use which may include physical, chemical, biological, and economic factors described in 40 C.F.R. § 131.10(g).

EPA is charged with assuring that any change in a State's water quality standards is consistent with the requirements of the Clean Water Act. As the Act requires States to consider the "use and value for public water supplies," EPA Region III would, at a minimum, require that the State provide an assessment demonstrating why removal of a public drinking supply use is warranted. Region III believes that such an assessment would include at least the following:

- A qualitative assessment of the interactions between the various instream and offstream designated uses of a waterbody;
- An identification of those waters where the drinking water supply use designation will apply;
- An identification of those waters where the drinking water supply use does not exist, and the designated use will be removed;
- Sound rationale to justify the removal of the drinking water supply use designation for waters identified above. Such a rationale would include analysis of the factors set forth at 40 C.F.R. § 131.10(g), and documentation that the waters are not used as a source of drinking water, there are no drinking water intakes, and there are no drinking water wells in the vicinity that are hydrologically connected to the surface waters in question;
- Assurance that the 101(a)(2) uses of the Clean Water Act will not be adversely impacted in the waterbodies; and
- Assurance that the downstream uses will be fully protected;
- Adequate public participation.

Region III has been asked whether the Environmental Quality Board's proposed review the West Virginia Bureau for Public Health's delineation of Zones of Critical Concern (ZCC) and determination of the applicability of these delineations for Category A redesignation would be an acceptable assessment. Region III cannot predetermine whether or not the ZCC's are an appropriate evaluation on which to base the drinking water supply use. It would seem likely that the ZCC would provide the type of information that could be useful in making this determination.

The foregoing applies only where the drinking water use is not an "existing" use as that term is defined in the applicable laws and regulations. As you may know, a designated use may not be removed if it is an existing use. Therefore, in segments where the stream has been used as a drinking water source on or at any time since November 28, 1975, the use would need to be retained. Region III is particularly concerned in cases where an individual uses water directly from the stream. The human health of those individuals, especially in rural areas, would not be protected if the drinking water supply use were removed. Upon the reassessment of Category A, we hope that the EQB will determine how to appropriately address this issue. In the meantime, we support the EQB's on-going research and offer our assistance in this matter.

It is important to note that for waters where the Category A use designation is removed, the protection of human health from toxic effects through fish consumption will be achieved through criteria that apply to the water contact recreation use (Category C).

We hope that this letter provides West Virginia with a better understanding of what EPA, Region III would expect should West Virginia decide to pursue a statewide redesignation of Category A. If you have any questions, please feel free to call Ray George at 304-234-0234, or Mary Kuo of my staff at (215)814-2390.

Sincerely,

Richard V. Pepino
Associate Director, Office of Watersheds

cc: Joe Altizer
Rita Pauley

tal protection (to prevent and control air pollution from coal refuse disposal areas, 45 CSR 1), is repealed.

§64-3-2. Environmental quality board.

The emergency rule relating to the environmental quality board (requirements governing water quality standards, 46 CSR 1) filed in the state register on the eighteenth day of October, one thousand nine hundred ninety-nine, and subsequently refiled in the state register on the fourteenth day of January, two thousand is repealed and not authorized. The legislative rule filed in the state register on the sixth day of August, one thousand nine hundred ninety-nine, authorized under the authority of section four, article three, chapter twenty-two-b, of this code, modified by the environmental quality board to meet the objections of the legislative rule-making review committee and refiled in the state register on the twenty-first day of January, two thousand, relating to the environmental quality board (requirements governing water quality standards, 46 CSR 1), is authorized, with the following amendment:

"On page ten, at the end of subdivision 6.2.d by adding a new sentence to read as follows:

'The manganese human health criteria shall not apply where the discharge point of the manganese is located more than five miles upstream from a known drinking water source'."

After the vote, David Yaussy, a lawyer for the state Manufacturers A thanked board members. So did Scott Goldman, a lawyer for the Ch Commerce.

Randy **Sovic**, technical analyst with the state Department of Environmental Protection, criticized the board's decision.

"It is very disappointing that we still don't have some clarification on this issue in the rule," **Sovic** said. "But the agency is going to continue its position unless directed to do otherwise by the board."

Also on Friday, Samuel was chosen to replace Snyder as the board's chairman. Snyder will continue to serve on the board.

To contact staff writer Ken Ward Jr., use e-mail or call 348-1702.

46 CSR 7
Procedural Rules Governing Reclassification of Waters Designated for Public Water Supply
September 17, 2002

Statement of Circumstances Requiring Proposed Rule

This proposed rule addresses the implementation of the Public Water Supply designated use category ("Category A") established in section 6.2 of the state Water Quality Standards (46 CSR 1 – Requirements Governing Water Quality Standards). The current implementation of Category A by the Division of Water Resources of the Department of Environmental Protection in the National Pollutant Discharge Elimination System (NPDES) permitting program is that the designated use applies to all waters of the state, unless it has been removed specifically by the Board. The Board supports this interpretation of the application of the Public Water Supply Use.

The Board acknowledges that circumstances may arise where the application of the Category A use may be determined to be inappropriate, and may result in instream permit limits that are unduly burdensome to an NPDES permit holder. In that case, the Category A use can be, and in fact has historically been, removed by amending the Water Quality Standards rule through the legislative process. The Board has heard a number of regulated industries express concern about the length of time required to remove the Category A designated use through the legislative rulemaking process. Because of the late July/early August filing requirement for revisions to legislative rules, it can take anywhere from a year to 18 months, or even longer to accomplish a use designation change.

The Board is proposing this procedural rule in order to address this concern. This rule establishes a process for removing the Category A use which, while retaining the substance and safeguards offered by the current procedures, results in a shorter time period from the date the application is filed to the final decision by the Board.

LETTER SENT MARCH 5, 2003 TO CHAIRMAN EDWARD SNYDER

Edward M. Snyder
Chairman, Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311

Dear Chairman Snyder:

We have reviewed 46 C.S.R. 7, "Procedural Rule Governing Reclassification of Waters Designated for Public Water Supply", which was filed on January 8, 2003. This procedural rule allows the Environmental Quality Board to remove the Category A (public water supply) use that is described in the water quality standards (46 C.S.R. 1). In effect, the Board would use a procedural rule, 46 C.S.R. 7, to amend a legislative rule, 46 C.S.R. 1, without legislative review.

As co-chairpersons of the Legislative Rule-Making Review Committee, we must reject any procedural rule such as 46 C.S.R. 7 that functions as a legislative rule, in derogation of West Virginia Code §§29A-3-1 et seq. We strongly urge the Board to reconsider its decision to adopt this procedural rule.

Please contact us at our legislative offices to discuss this problem. You may contact Senator Ross at 357-7973 and Delegate Mahan at 340-3106.

Senator Mike Ross,
Co-Chairperson, LRRC

Delegate Virginia Mahan
Co-Chairperson, LRRC

UNITED STATES ENVIRONMENTAL PROTECTION AGEN
REGION III
1650 Arch Street
Philadelphia, Pennsylvania 19103-2029

June 29, 2005

Dr. Edward M. Snyder, Ph.D., Chair
West Virginia Environmental Quality Board
601 57th Street, SE
Charleston, WV 25304

Dear Dr. Snyder:

West Virginia completed its 2004 triennial review of water quality standards and revisions to 46 CSR 1, *Requirements Governing Water Quality Standards* were submitted to the U.S. Environmental Protection Agency (EPA) on June 7, 2004, pursuant to Section 303(c) (2)(A) of the Clean Water Act (CWA) and 40 C.F.R 131.20 (a). These revisions were approved by the West Virginia Legislature in the 2004 session and became effective on July 1, 2004. The West Virginia Office of the Attorney General also certified that these revisions were duly adopted and authorized pursuant to the laws of the State of West Virginia during the 2004 Legislative session. EPA Region III received this triennial review package on June 14, 2004. In a letter dated December 17, 2004, EPA approved that submission, in large part, and deferred action on the addition of the last sentence in Section 6.2.d while we evaluated and collected additional information sufficient to finalize a decision. The new sentence provides that: "The manganese human health criterion shall only apply within the five-mile zone immediately upstream above a known public or private water supply used for human consumption" (the "Manganese Five-Mile Rule"). After the triennial package was submitted to EPA, EPA received other information on the Manganese Five Mile Rule, consisting primarily of information and comments from interested parties. EPA Region III received this information on June 22 and July 21, 2004, and April 14, 2005.

The purpose of this letter is to approve the "Manganese Five-Mile Rule" submission as consistent with the requirements of the CWA and the applicable Federal regulations at 40 C.F.R. Part 131. Enclosure 1 identifies and sets forth a rationale for EPA's approval in accordance with Section 303 (c)(3) of the CWA and 40 C.F.R. Part 131. West Virginia's new or revised Water Quality Standards approved today are now effective for CWA purposes.

If you have any questions concerning this letter, please contact me at (215) 814-5422 or Ms. Cheryl Atkinson at (215) 814-3392.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

Enclosure 1

ENVIRONMENTAL PROTECTION AGENCY, REGION III
TITLE 46 LEGISLATIVE RULES SERIES 1
REQUIREMENTS GOVERNING WATER QUALITY
2004 TRIENNIAL REVIEW

APPROVAL OF NEW AND REVISED ITEMS

Addition of the "Manganese Five-Mile Rule" sentence in Section 6.2.d. Regulatory language was added to have the manganese human health criterion apply only within the five-mile zone immediately upstream above a known public or private water supply used for human consumption (Mn 5-mile Rule).[1] In consideration of the following factors, EPA finds that this new Rule is protective of the designated use and consistent with the Clean Water Act.

On June 24, 2003, EPA approved West Virginia's adoption of 1 mg/L of manganese, that West Virginia adopted for its public water supply use, as protective of that public water supply use.[2] Manganese has a very low toxicity via oral ingestion, and drinking water accounts for a relatively small proportion of the total manganese intake by humans. Indeed, EPA has decided not to regulate manganese as a contaminant under the Safe Drinking Water Act (SDWA). The National Recommended Water Quality Criteria for manganese for human health is based not on toxic effects, but rather on the non-enforceable SDWA secondary drinking water standard, established for organoleptic reasons.

The addition of the Mn 5-mile Rule does not change the numeric manganese criterion for

---

[1] The phase "known public or private water supply used for human consumption" includes those uses as defined in the approved State regulation at Section 6.2, for Category A, Public Water Supply. "Public Water Supply includes waters which, after conventional treatment, are used for human consumption. This category includes streams where the following are located:

a. All community domestic water supply systems;

b. All non-community domestic water supply systems;

c. All private domestic water systems;

d. All other surface water intakes where the water is used for human consumption."

Section 46-1-6.2 (numeration altered).

[2] June 24, 2003, letter from Jon Capacasa, Water Protection Division, EPA Region III to Dr. Edward Snyder, West Virginia Environmental Quality Board; see also January 14, 2004, Memorandum, U.S. Dist. Ct. Eastern Dist. PA (finding EPA's 2003 decision to approve West Virginia's manganese human health criterion reasonable).

protection of the public water supply in West Virginia. That criterion has not been modified and continues to apply in West Virginia. Rather, the Mn 5-mile Rule specifies the proper application of the approved criterion. In this case the rule creates a zone upstream from public and private drinking water intakes to protect the public water supply use from increased levels of manganese.

On June 26, 2003, EPA disapproved a prior version of this regulation.[3] The 2000 version of the Mn 5-mile Rule Mn (Section 6.2.d as adopted in May 2000) read as follows:

> "The manganese human health criteria shall not apply where the discharge point of the manganese is located more than five miles upstream from a known drinking water source."

EPA disapproved that provision because it relied on the location of the discharge to determine whether the criteria would apply. Under the 2000 Mn 5-mile rule, a discharger might be exempted from effluent limitations to meet the manganese criterion based on its distance from the intake point, regardless of the impact on the quality of the water to be used as public water supply. EPA indicated in its disapproval letter that, in the absence of a sound scientific rationale, West Virginia could not so limit the application of the criterion.

In contrast to the 2000 rule, the current Mn 5-mile rule ensures the manganese criterion applies to all waters and five miles above public and private water intakes. The manganese criterion continues to apply at all these intakes, as well as within a five-mile zone upstream of the intakes. The West Virginia Department of Environmental Protection (DEP), which is the State agency which issues National Pollutant Discharge Elimination System (NPDES) permits, will ensure that the instream concentration of manganese does not exceed the water quality standard five miles above a drinking water intake point through the incorporation of effluent limitations into permits.[4] The DEP will impose such water quality-based effluent limitations as necessary, regardless of the location of the facility itself.

Therefore, this change in the water quality standard should not have an impact on the water withdrawn for drinking, the drinking water treatment processes and the cost of treating water for drinking. All water withdrawn for drinking by private and public intakes that was covered under the designated use and thus protected by the manganese criterion prior to the

---

[3] June 26, 2003, letter from Jon Capacasa, Water Protection Division, EPA Region III to Dr. Edward Snyder, West Virginia Environmental Quality Board.

[4] March 24, 2005, letter from Lisa McClung, Division of Water and Waste Management, West Virginia Department of Environmental Protection to Dr. Edward Snyder, West Virginia Environmental Quality Board, with enclosure.

Mn 5- mile rule, continues to be subject to the applicable 1 mg/L manganese criterion. Therefore, the application of the manganese criterion as provided by the Mn 5-mile rule continues to protect the public water supply use, as defined.

The application of a criterion for the protection of public water supply at the intake point is consistent with EPA's approvals in other states. EPA has approved applications of human health criteria at the intake or withdrawal points in other States as well. See 35 Ill. Adm. Code § 303.202; 327 Ind. Adm. Code § 2-1-3; 401 Ky. Adm. Regs. § 5:031; Ohio Adm. Code §3745-1-07; Sec. 5.

Commenters on the rule raised the concern of whether West Virginia is aware of and could identify all private and public intakes covered by the designated use. In a March 24, 2004, letter commenting on the Mn 5-mile Rule, the DEP explained that it maintains a database of known water intakes, which DEP has committed to update when a new intake is established or identified.[5] In addition, DEP intends to require NPDES permit applicants to search for intakes, and certify their presence or absence. WV NPDES mining permits already require applicants to list private and public water supplies downstream from the facility. Whenever a new water supply intake is constructed, DEP will evaluate existing permits and modify them if necessary. DEP is confident that through these procedures it can identify the covered intakes and properly protect the water quality through appropriate water quality-based effluent limitations. We find that the steps that DEP will take to insure the proper application of the manganese standard are reasonable, and will result in the protection of the designated use. The DEP, which beginning in July 2005 will be the agency with the authority to promulgate water quality standards and which has been involved in the public processes on all the versions of this rule, supports the Mn 5-mile rule.

Finding that this provision is protective of the designated use, EPA also considered whether the public had adequate opportunity to participate in the adoption of this provision. Some commenters raised concerns regarding the adequacy of public participation because this rule was directly enacted by the West Virginia Legislature. After full review of the record and history of this provision, EPA has decided that public participation was adequate, for the following reasons.

While this provision was adopted by the West Virginia Legislature, rather than first adopted by the West Virginia Environmental Quality Board (EQB), that does not mean that the public did not have an adequate opportunity throughout the process to provide comments and express their views regarding this provision. The public had, and exercised many opportunities to provide comment on this provision over the past five years as this provision was debated and adopted. In October 1999, EQB proposed the first version of a rule imposing a five-mile zone for the manganese criterion. EQB conducted a public hearing, solicited comments from the public on the proposal, and responded to those comments. Throughout the hearings and public

[5] *Id.*

comment processes discussing the different versions of this rule, the public has had opportunities to present their thoughts and concerns on these matters. Beginning in 2003, the West Virginia Legislature began discussions of the Mn 5-mile rule. Public debates on the rule were conducted by Legislative Committees. In June 2004, after the Legislature adopted the rule, the EQB provided the public another opportunity to comment on the Mn 5-mile rule. In addition, the EQB held a public hearing and another public comment period on February 2005. The EQB responded to the comments, and provided the comments and responses, together with a transcript of the hearing to EPA. EPA reviewed the comments and responses as part of the decision to approve the State's Rule. It is clear from a review of the public's comments that they were fully informed as to the issues that were raised by the Rule, and the State's position on the Rule. EPA has concluded that the public had adequate opportunity to provide comment on the Mn 5-mile Rule.

WEST VIRGINIA HOUSE OF DELEGATES

2012 FIRST REGULAR SESSION

SB 562

Establishing DEP procedure for biologic component compliance of narrative water quality standard

RCS# 453
3/10/2012
10:41 PM

562

PASSAGE

YEAS: 94 NAYS: 6 NOT VOTING: 0 PASSED

YEAS: 94

Anderson	Evans	Marshall	Rodighiero
Andes	Ferns	Martin	Romine
Armstead	Ferro	Michael	Rowan
Ashley	Fragale	Miley	Shaver
Azinger	Frazier	Miller, C.	Sigler
Barill	Givens	Miller, J.	Skaff
Barker	Guthrie	Moore	Smith
Boggs	Hall	Morgan	Snuffer
Border	Hamilton	Moye	Sobonya
Brown	Hartman	Nelson	Staggers
Butcher	Hatfield	O'Neal	Stephens
Campbell, D.	Householder	Overington	Storch
Campbell, T.	Howell	Pasdon	Stowers
Cann	Hunt	Paxton	Sumner
Canterbury	Iaquinta	Perdue	Swartzmiller
Caputo	Ireland	Perry	Talbott
Carmichael	Jones	Pethtel	Varner
Craig	Kump	Phillips, L.	Walker
Crosier	Lane	Phillips, R.	Wells
Diserio	Lawrence	Pino	White
Doyle	Longstreth	Poling, D.	Williams
Duke	Mahan	Poling, M.	Speaker Thompson
Ellem	Manchin	Poore	
Ellington	Marcum	Reynolds	

NAYS: 6

Cowles	Gearheart	Savilla
Fleischauer	Manypenny	Walters

NOT VOTING: 0

ENROLLED
COMMITTEE SUBSTITUTE
FOR
Senate Bill No. 562

(SENATORS KESSLER (MR. PRESIDENT), BEACH, D. FACEMIRE, FANNING, HALL, HELMICK, PREZIOSO, PLYMALE AND KLEMPA, *original sponsors*)

[Passed March 10, 2012; in effect from passage.]

AN ACT to amend and reenact §22-11-7b of the Code of West Virginia, 1931, as amended, relating to establishing a public policy for narrative water quality standards; establishing a procedure to determine compliance with the biologic component of the narrative water quality standard; and clarifying that narrative water quality rules cannot be less protective than current requirements.

Be it enacted by the Legislature of West Virginia:

That §22-11-7b of the Code of West Virginia, 1931, as amended, be amended and reenacted to read as follows:

ARTICLE 11. WATER POLLUTION CONTROL ACT.

§22-11-7b. Water quality standards; implementation of antidegradation procedures; procedure to determine compliance with the biologic component of the narrative water quality standard.

(a) All authority to promulgate rules and implement water quality standards is vested in the Secretary of the Department of Environmental Protection.

(b) All meetings with the secretary or any employee of the department and any interested party which are convened for the purpose of making a decision or deliberating toward a decision as to the form and substance of the rule governing water quality standards or variances thereto shall be held in accordance with the provisions of article nine-a, chapter six of this code. When the secretary is considering the form and substance of the rules governing water quality standards, the following are not meetings pursuant to article nine-a, chapter six of this code: (i) Consultations between the department's employees or its consultants, contractors or agents; (ii) consultations with other state or federal agencies and the department's employees or its consultants, contractors or agents; or (iii) consultations between the secretary, the department's employees or its consultants, contractors or agents with any interested party for the purpose of collecting facts and explaining state and federal requirements relating to a site specific change or variance.

(c) In order to carry out the purposes of this chapter, the secretary shall promulgate legislative rules in accordance with the provisions of article three, chapter twenty-nine-a of this code setting standards of water quality applicable to both the surface waters and groundwaters of this state. Standards of quality with respect to surface waters shall protect the public health and welfare, wildlife, fish and aquatic life and the present and prospective future uses of the water for domestic, agricultural, industrial, recreational, scenic and other legitimate beneficial uses thereof. The water quality standards of the secretary may not specify the design of equipment, type of construction or particular method which a person shall use to reduce the discharge of a pollutant.

(d) The secretary shall establish the antidegradation implementation procedures as required by 40 C. F. R. 131.12(a) which apply to regulated activities that have the potential to affect water quality. The secretary shall propose for legislative approval, pursuant to article three, chapter twenty-nine-a of the code, legislative rules to establish implementation procedures which include specifics of the review depending upon the existing uses of the water body segment that would be affected, the level of protection or "tier" assigned to the applicable water body segment, the nature of the activity and the extent to which existing water quality would be degraded. Any final classification determination of a water as a Tier 2.5 water (Water of Special Concern) does not become effective until that determination is approved by the

Legislature through the legislative rule-making process as provided in article three, chapter twenty-nine-a of the code.

(e) All remining variances shall be applied for and considered by the secretary and any variance granted shall be consistent with 33 U. S. C. Section 1311(p) of the Federal Water Control Act. At a minimum, when considering an application for a remining variance the secretary shall consider the data and information submitted by the applicant for the variance; and comments received at a public comment period and public hearing. The secretary may not grant a variance without requiring the applicant to improve the instream water quality as much as is reasonably possible by applying best available technology economically achievable using best professional judgment. Any such requirement will be included as a permit condition. The secretary may not grant a variance without a demonstration by the applicant that the coal remining operation will result in the potential for improved instream water quality as a result of the remining operation. The secretary may not grant a variance where he or she determines that degradation of the instream water quality will result from the remining operation.

(f) The secretary shall propose rules measuring compliance with the biologic component of West Virginia's narrative water quality standard requires evaluation of the holistic health of the aquatic ecosystem and a determination that the stream: (i) Supports a balanced aquatic community that is diverse in species composition; (ii) contains appropriate trophic levels of fish, in streams that have flows sufficient to support fish populations; and

(iii) the aquatic community is composed of benthic invertebrate assemblages sufficient to perform the biological functions necessary to support fish communities within the assessed reach, or, if the assessed reach has insufficient flows to support a fish community, in those downstream reaches where fish are present. The secretary shall propose rules for legislative approval in accordance with the provisions of article three, chapter twenty-nine-a of this code that implement the provisions of this subsection. Rules promulgated pursuant to this subsection may not establish measurements for biologic components of West Virginia's narrative water quality standards that would establish standards less protective than requirements that exist at the time of enactment of the amendments to this subsection by the Legislature during the 2012 regular session.

HOUSE CONCURRENT RESOLUTION NO. 111

RESOLUTION HISTORY:

Date	Action	Journal Page
03/13/10	House received Senate message	2639
03/13/10	Completed legislative action	
03/13/10	Communicated to House	259
03/13/10	Adopted by Senate (Voice vote)	259
03/13/10	Immediate consideration	258
03/13/10	Reported be adopted	258
03/13/10	To Energy, Industry and Mining	109
03/13/10	To Energy, Industry and Mining	109
03/13/10	Introduced in Senate	109
03/12/10	Communicated to Senate	1813
03/12/10	Adopted by House, Special Calendar (Voice vote)	1813
03/12/10	Reported by the Clerk	1813
03/12/10	From House Calendar, Unfinished Business, to Special Calendar	
03/11/10	Be adopted	1399
03/10/10	To House Rules	1214
03/10/10	Introduced in House	1214
03/10/10	To Rules	
03/10/10	Filed for introduction	

Urging the United States Environmental Protection Agency to interpret the West Virginia Water Pollution Act in the manner that will faithfully balance the protection of the environment with the need to maintain and expand opportunities for employment, agriculture and industry as set forth in the Legislature's statement of public policy as contained in the West Virginia Water Pollution Control Act.

Whereas, In enacting the Federal Water Pollution Control Act Congress declared that "it is the policy of Congress to recognize, preserve and protect the primary responsibilities and rights of States to prevent, reduce, and eliminate pollution, to plan the development and use of land and water resources?." ; and

Whereas , As an exercise of its sovereign and primary right to plan the development and use of its lands and water resources the West Virginia Legislature previously enacted Chapter 22 Article 11 of the 1931 Code of West Virginia as amended, the West Virginia Water Pollution Control Act, and in that enactment declared it to be "the public policy of the State of West Virginia to maintain reasonable standards of purity and quality of the water of the state consistent with (1) public health and enjoyment thereof; (2) the propagation and protection of animal, bird, fish, aquatic and plant life; and (3) the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development."; and

Whereas , The State of West Virginia has developed and implemented environmental protection performance and permitting standards to adequately protect the waters of the State consistent with this statement of public policy; and

Whereas , Such standards have been promulgated by the West Virginia Department of Environmental Protection and the Legislature and submitted to and approved by the United States Environmental Protection Agency pursuant to the federal Clean Water Act; and

Whereas , These environmental protections and permitting measures include narrative water quality standards codified at 47 CSR 2-3; and

Whereas, West Virginia's narrative standards must be implemented and interpreted in a manner that is protective of aquatic communities consistent with the Legislature's statement of public policy and applicable laws; and

Whereas, The State of West Virginia has not adopted subcategories of special use to protect a certain species of mayfly but protects the aquatic community consistent with the Legislature's statement of public policy; and

Whereas, West Virginia's economic stability relies on the accurate implementation of applicable laws as enacted by the Legislature; and

Whereas, The current method in which the United States Environmental Protection Agency is interpreting the West Virginia Water Pollution Control Act is hindering economic development within the state which directly affects the employment opportunities available to all West Virginians; and

Whereas, The West Virginia Legislature would not enact legislation that would have a detrimental effect on the industrial progression of the state and cause or contribute to environmental degredation; therefore, be it

***Resolved by the Legislature of West Virginia*:**

That any interpretation and implementation of West Virginia's narrative water quality standards is the responsibility of the West Virginia Department of Environmental Protection; and, be it

***Further Resolved* , That the requirements of the narrative criteria are met, when a stream (a) supports a balanced aquatic community that is diverse in species composition; and (b) contains appropriate trophic levels of fish (in streams with sufficient flows to support fish populations); and (c)the aquatic community is not composed only of pollution tolerant species, or the aquatic community is composed of benthic invertebrate assemblages sufficient to perform the biological functions necessary to support fish communities within the assessed reach (or, if the assessed reach has insufficient flows to support a fish community, in those downstream reaches where fish are present); and, be it**

***Further Resolved*, That interpretation of West Virginia's narrative water quality standards must faithfully balance the protection of the environment with the need to maintain and expand opportunities for employment, agriculture and industry as set forth in the Legislature's statement of public policy as contained in the West Virginia Water Pollution Control Act; and, be it**

Further Resolved, **That the West Virginia Legislature encourages the United States Environment Protection Agency to change their current interpretation of the West Virginia Water Pollution Control Act to include the intent of the 72nd and subsequent Legislatures; and be it**

Further Resolved, **That the Clerk of the House of Delegates forward a certified copy of this resolution to the West Virginia Department of Environmental Protection, the United States Environmental Protection Agency, the Huntington District of the United States Army Corps of Engineers, and other appropriate state and federal agencies.**