BUREAU OF THE ENVIRONMENT
ENVIRONMENTAL QUALITY BOARD
1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311-2126
(304) 558-4002
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MINUTES
WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD
APRIL 21st, 2000

I. General

On April 21, 2000, a quorum of the members of the Environmental Quality Board (hereinafter referred to as the "Board") met at its offices located at 1615 Washington St. E., Charleston, West Virginia. Don Tarter, Co-Chair, called the Environmental Quality Board meeting to order at 9:00 a.m.

Other Board members present were as follows:

Ed Snyder, Co-Chair
Charles Jenkins
David Samuel

Board Member participating by telephone:

Betsy Dulin from 2:00 p.m. - 3:00 p.m., Discussion of Appeal #99-03-EQB (7-Eleven)

Whereupon, the Board addressed the issues set forth in the Agenda as follows:

II. Rulemaking

1. 46 CSR 1 - Requirements Governing Water Quality Standards

A. USEPA recommendations from June 1999 letters to Board:

1. Aluminum - Presentation on behalf the West Virginia Farm Bureau by Dr. Louis McDonald:

Mr. Sam Lockard of the West Virginia Farm Bureau requested that the Board hear a presentation on aluminum and iron from Dr. Louis McDonald of West Virginia University. Dr. McDonald discussed his rationale for the dissolved metals standard vs. a total iron and aluminum criteria for surface waters impacted by agriculture. Dr. McDonald informed the Board that it is his opinion that a dissolved aluminum standard is the only scientifically defensible standard to use to measure the aluminum content of a water body. Dr. McDonald stated that since it is the dissolved metals which are toxic, the dissolved metals measurement should be the standard used to measure the impairment of waters. Letters from the West Virginia Farm Bureau and Dr. McDonald are attached to and made a part of these minutes as Exhibit "A". Two documents from the WV Manufacturer's Association regarding the aluminum water quality standard are also attached as Exhibit "B".

B. Variance - §7.2.d.16.2 Harmon Creek Water Quality Criteria (Weirton Steel):

In 1997, Weirton Steel was granted a variance from certain water quality standards at the Harmon Creek Outfall. That variance was for several parameters, including temperature, cyanide, phenols, iron, lead and zinc, and was based on socioeconomic parameters. The Board, when granting this variance in 1997, directed Weirton Steel to improve the discharge into Harmon Creek and to provide the Board with annual reports summarizing the water quality of the discharge and the progress that the Company has made to improve it.

Mr. Mark Vignovic, a representative of Weirton Steel, informed the Board that the Company has made improvements in the water quality of the discharge into Harmon Creek. The Company is able to comply with the State's water quality standards for cyanide and phenol. Weirton Steel is now requesting another three year socioeconomic variance for the remaining four parameters; temperature, iron, zinc and lead. Mr. Vignovic stated that if the Board grants this variance the company will continue to explore methods of improving the quality of the discharge at Harmon Creek and will continue to provide the semi-annual reports.

In support of the variance request, Weirton Steel provided the Board with the results of a study entitled "Financial and Socioeconomic Effects of Compliance with West Virginia Water Quality Regulations at Harmon Creek". The study

indicates that the estimated capital cost to ensure compliance with the State's water quality criteria at the Harmon Creek Outfall for these parameters would be approximately 35 million dollars. The study also indicates that Weirton Steel cannot afford to incur such costs and that being forced to do so could result in widespread socioeconomic harm to the community. A copy of this document is attached to and made a part of these minutes as Exhibit "C".

Ms. Chatfield informed the Board that the USEPA is also reviewing the socioeconomic information but has not yet completed that review. In order to afford the Board members the opportunity to review the socioeconomic information and obtain input from the USEPA, the Board decided to place the Weirton Steel variance request on the agenda for the May 11, 2000, Board meeting.

C. Blackwater River

1. Update on the Upper Blackwater Use Removal Application:

Ms. Chatfield provided the Board with an update on the upper Blackwater Use Removal request. The Board received a letter from the Blackwater River Watershed Association requesting that they be allowed to make an oral response to the presentation provided to the Board on January 12, 2000, by the WV Rivers Coalition and the Division of Natural Resources. Their submission also contained a written response to that presentation. In addition, they requested that the Board schedule a meeting and travel to the Blackwater area to discuss this issue with local residents.

In response to the Blackwater River Watershed Association's request, the West Virginia Rivers Coalition submitted a letter to the Board voicing their concerns regarding the Association's request. Mr. Don Phares, assistant chief of special projects with the Division of Natural Resources, also submitted a response to the Blackwater River Watershed Association evaluation of the January 2000, Division of Natural Resources report presented to the Board. Copies of these documents and letters received by the Board in support of retaining the current use designation for the upper Blackwater River from Senator Jon Blair Hunter and Delegate Vicki Douglas, are attached to and made a part of these minutes as Exhibit "D".

Initially, the Board received a Use Attainability Analysis from the Blackwater River Watershed Association regarding the upper Blackwater River and a request for a use removal. Subsequently, the Board heard presentations from the environmental community, West Virginia Rivers Coalition, and the WV Division of Natural Resources objecting to such removal. In addition, the Board has provided ample opportunity for the general public to provide comments.

Whereupon, Dr. Jenkins moved and Dr. Samuel seconded that the Board decline the Blackwater River Watershed Association's request for a hearing in the Blackwater River area, and the motion passed unanimously 4 to 0.

The Board requested that Ms. Chatfield communicate with the Division of Environmental Protection and the USEPA regarding their relative positions on the use redesignation for the upper Blackwater River. The Board then directed that the decision on the use removal for the upper Blackwater River be placed on the May 11, 2000, meeting agenda.

D. Remining Variance - Little Boyd Coal Company (Kempco):

During the previous Board meeting the Board reviewed the Little Boyd Coal Company remining variance application. After the review of the document, the Board requested additional information from the Coal Company, including a comparison of an existing area valley fill in the vicinity of the proposed remining site to the proposed valley fill. Mr. Lantz Rankin of Heritage Surveying and Mapping in Danville, WV, appeared representing the Little Boyd Coal Company (Kempco) to address this issue and provided the Board with a comparison chart which illustrates the type of material in the valley fills, an acid base accounting of the material, the placement of the materials, the final configuration and the water type. A copy of this chart is attached to and made a part of these minutes as Exhibit "E".

The Board informed Mr. Rankin that the concept of the remining variance program is to improve the water quality standards in areas where pre-law mining occurred. The procedural rules governing variances for water quality standards for remining activities (§46 CSR 6.11.a) provides that the Board may not grant a variance from water quality standards for remining activities without requiring the applicant to improve the in stream water quality as much as is reasonably possible

by applying the best available technology economically achievable using best professional judgement.

Mr. Rankin provided the Board with amended language regarding their proposed abatement plan, which demonstrates that the company considered other options to the valley fill including the addition of fly ash from utility plants, limestone supplement and ammonia injection. The company determined that all of these options were cost prohibitive or would require perpetual maintenance involving equipment and labor. Dr. Jenkins requested that the company provide the figures and data to support their cost prohibitive assertion. A copy of the amended abatement plan is attached to and made a part of these minutes as Exhibit "E".

Since the Board may not grant a variance from water quality standards for remining activities without requiring the applicant to improve the in stream water quality as much as is reasonably possible, the Board expressed concern that the improvements to the water quality as proposed by the Company in the remining variance application are not significant. The company proposes improving manganese from 7.044 ppm to 7.07 ppm and improving pH from 3.7 S.U. to 3.72 S.U.. Dr. Jenkins stated that he would like to see more improvement in the water quality. According to Chris White, of Compliance Monitoring Labs, to improve and maintain a healthy benthic population in the stream, would require a pH level of 6 S.U.

In addition, §46 CSR 6.11.c provides that the Board may not grant a remining variance if degradation of the existing instream water quality will result from the remining operation. The remining variance application provides that the creation of valley fills is necessary and will serve as a buffer to help neutralize some of the water shed drainage contributing to the preexisting degraded water quality. However, Dr. Snyder stated that this broad, general statement is unacceptable and must instead be site specific with quantification to justify it before he would be willing to consider a valley fill.

Ms. Chatfield noted that the Board may grant a site-specific remining variance if, after a review of the variance application and the national pollutant discharge elimination system (NPDES) remining permit application, it determines that all requirements have been met. The Board is assuming that the remining variance is in compliance with the DEP remining policy. However, Ken Politan, of the Office

of Mining and Reclamation stated that the application has not been completed and provided to his office for review. Mr. Politan suggested that the Board delay action on the remining variance application until NPDES application has been reviewed and the draft NPDES permit has been completed.

The Board will revisit the remining variance application during the June 2, 2000 Board meeting.

E. USEPA recommendations from June 1999 letters to Board:

1. Natural Background Exemption:

Board has been reviewing the numeric criteria for natural conditions, including those adopted by other states and subsequently approved by the USEPA. During the previous Board meeting, the Board directed Ms. Charles to draft natural background language for inclusion in West Virginia's rule which would include the language in the Alaska Natural Background provision, which has been approved by the USEPA. This language was provided to the Board and is attached to and made a part of these minutes as exhibit "F".

The Natural Background language provides that where a natural condition of a waterbody is demonstrated to be of lower quality than a water quality criterion for the use classes, the Board, in its discretion, may establish a site-specific quality criterion for aquatic life. The process to establish the natural background site-specific water quality criterion would follow the same procedure as a variance request.

Whereupon, Dr. Samuel moved and Dr. Snyder seconded that the Board propose the natural background language as drafted by Ms. Charles, as an amendment of the water quality standards, and the motion passed unanimously 4 to 0.

2. Selenium - Site Specific (Fly Ash Run)

Section 7.2.d.8.1. Site-specific criterion for selenium for Fly Ash Run. EPA disapproved the site specific selenium criterion in this section. It is one of several site-specific criteria approved by the Board during the last triennial review for Allegheny Power Company's discharge into Fly Ash Run from the Albright Power

Station. EPA's concern is that bio-accumulation of selenium may be occurring in aquatic life in the stream.

The company has worked with the EPA to develop an agreeable selenium value protocol. The facility has requested adoption of alternate frequency and duration provisions as an amendment to the Water Quality Standards rule. Representative from Region III EPA and WVDEP have reviewed the language and supports it's adoption. A memorandum from Ms. Chatfield and two letters from Allegheny Energy regarding the proposed selenium language is attached to and made a part of these minutes as Exhibit "G".

Whereupon, Dr. Samuel moved and Dr. Snyder seconded that the Board adopt the proposed site-specific criterion for selenium at Fly Ash Run, and the motion passed unanimously 4 to 0. The Board further directed Ms. Chatfield to work with DEP and the EPA to create a monitoring program.

3. Manganese - Section 8.17.1

The Environmental Quality Board proposed an Emergency Rule on October 18, 1999 which contained amendments to the "Public A" use category and an exemption for manganese. The manganese proposal was disallowed by the Secretary of State's Office. However, during the 2000 Legislative Session, the Legislature rejected the Board's proposed new language as well as amendments proposed by members of the regulated industry. Instead they retained the existing language of the Water Quality Standards rule with the addition of the manganese exemption.

Because the Legislature retained the existing language of the rule but added a new manganese exemption, the new rule will contain two different manganese exemptions. Whereupon, Dr. Snyder moved and Dr. Samuel seconded that the Board remove the "old" manganese exemption contained at §8.17.1 of the rule, and the motion passed unanimously 4 to 0.

4. Antidegradation - update on stakeholder group meetings

The Board was informed that the Stakeholders held their final meeting on April 17, 2000. There are some issues which the Stakeholders could not resolve and the

group may meet again to attempt to resolve the socioeconomic evaluation process. Ms. Chatfield will be providing the final antidegradation document to the Board for review prior to the May 11, 2000, Board meeting. The Stakeholders will be available during the May 11th Board meeting to respond to any questions which the Board may have and some may submit position papers to describe their position on issues where a consensus was not reached. In addition, the stakeholders have asked to be allowed to appear before the Board during the May 11th Board meeting. The Board discussed placing time limits for each member presentation and scheduled an additional Board meeting for June 2, 2000, in order to allow ample time to address all of the antidegradation issues.

F. Triennial Review - update on comments received by the Board

The Board received copies of all of the comments received as a result of the Notice of the Triennial review. The Board directed Ms. Chatfield to prepare a summary of those comments and to prioritize the issues. Because of the number of comments received by the Board, these comments are not attached to these minutes but are on file in the Board offices.

G. Category A - Public Drinking Water Supply Use Designation update:

Ms. Chatfield stated that she will be meeting with the WV Manufacturers Association and their water team to discuss the status of Category A. In addition, the Bureau for Public Health has informed Ms. Chatfield that they will complete the delineation of the Zones of Critical Concern by July 1, 2000.

H. Final Filing of amendments to Water Quality Standards Rule made during the 2000 Legislative Session - update and establish effective date:

Since there were amendments made to the Water Quality Standards rule during the 2000 Legislative session, the Board is now required to complete a final filing of the rule which incorporates those amendments and to establish the effective date of the rule. Thereupon, Dr. Snyder moved and Dr. Jenkins seconded that the effective date of the rule be July 1, 2000, and the motion passed unanimously 4 to 0.

III. Appeals

1. Appeal #99-09, #99-10, #99-11(Knouse) - Progress Report on Settlement Negotiations:

On April 21, 2000, the Board conducted a telephone status conference to discuss the progress of the settlement negotiations between the parties of the appeals. After listening to the status report, the Board determined that all of the parties had not actively participated in the settlement negotiations and directed all parties to meet to discuss the issues of the consolidated appeals on April 26th, 2000, and to submit to the Board a written status report on May 5, 2000. These reports are to address **only** the progress of the settlement negotiations and **not** any of the issues contained in the consolidated appeals. Unless significant progress toward a settlement is reported, the hearing on the consolidated appeals will be held on June 1, 2000.

2. Appeal #99-03-EQB (7-Eleven):

At 2:00 p.m. Board member Betsy Dulin joined the meeting via telephone in order to discuss and make a final determination in Appeal #99-03 (7-11). The Board members agreed that the Notice portion of the insurance policy is not an actual part of the insurance policy coverage language. The Board voted 2 to 1, with Dr. Snyder voting against; and Dr. Jenkins and Dr. Tarter abstaining, to find that the Appellee committed an egregiously negligent act, but that such act was not willful and deliberate. The Board then directed Ms. Charles to draft an Order outlining their position on the matter for their review and approval during the May 11, 2000, Board meeting. Ms. Dulin then left the meeting.

3. Appeal #540, 541, 542 (Lackawana/Velero):

On October 5, 1999, Judge Herman Canady, Jr. vacated the Board's decision and remanded the appeal to the Board. It became the obligation of the Board to proceed with the appeal in light of the Circuit Court's order.

Due to the time elapsed since the initial appeal was decided, the Board felt that it was possible that the appeal was now moot, irrelevant or that the Appellants no longer wished to pursue their appeal. On March 3, 2000, the Environmental

Quality Board ordered any of the Appellants desirous of pursuing these appeals to file a response with the Board which indicates their interest. The Board's order clearly stated that the Board would interpret the failure to respond within the time frame as a lack of interest to pursue the appeal and would dismiss the consolidated appeals without further hearing. The deadline for filing such response was March 31, 2000.

None of the Appellants filed such a response. The Board found that the failure of the parties to respond within the prescribed time frame constitutes a lack of interest in pursuing the appeal. Whereupon, Dr. Samuel moved and Dr. Snyder seconded that Appeal #540, #541 and #542 be dismissed and removed from the Board's docket, and the motion passed unanimously 4 to 0.

4. Appeal #00-01-EQB (Ripley) - Appellee's Motion to Dismiss Appellant's Estoppel, Tax and Equal Protection:

On April 6, 2000, the Appellee filed a Motion to Dismiss Appellant's Estoppel, Tax and Equal Protection Claims contained in the appeal. The Appellant filed a response motion which was also provided to the Board. The Board found that the Appellee's Motion to Dismiss the Appellant's Estoppel, Tax and Equal Protection Claims had merit. Whereupon, Dr. Jenkins moved and Dr. Snyder seconded that the Board grant the Appellee's Motion to Dismiss the Appellee's Estoppel, Tax and Equal Protection Claims, and the motion passed unanimously 4 to 0 .

5. Appeal #00-02-EQB (Ravenswood) - Appellee's Motion to Dismiss Appellants' Estoppel, Tax and Equal Protection:

The Board was provided with the Appellee's Motion to Dismiss Appellant's Estoppel, Tax and Equal Protection Claims as contained in the appeal. However, the response to this motion is not due until 5:00 p.m. on April 21, 2000. Consequently the Board will not rule on this motion.

6. Appeal #00-03-EQB (Gillispie) - Proposed Agreed Order:

Ms. Charles presented the Board with a Proposed Agreed Order submitted by the parties of this appeal. After reviewing the proposed order, Dr. Samuel moved and Dr. Snyder seconded that the Board accept the proposed order, dismiss Appeal

#00-03, and remove it from the Board's docket, and the motion passed unanimously 4 to 0.

7. Appeal #00-04-EQB (Mon. Co. Comm.) - Appellee's Motion to Dismiss for Lack of Subject Matter Jurisdiction:

The above appeal was filed on March 2, 2000, and was set to be heard during the July 2000, Board meeting. On April 4, 2000, the Appellee filed a Motion to Dismiss for Lack of Subject Matter Jurisdiction. The Appellant did not file a written response to this motion.

The Environmental Quality Board does not have jurisdiction over the matters contained in the appeal. Whereupon, Dr. Snyder moved and Dr. Jenkins seconded that Appeal #00-04-EQB (Monongalia County Commission) be dismissed and removed from the Board's docket, and the motion passed unanimously 4 to 0.

IV. Administrative Matters

1. Review and approval of the February 28th and April 3rd, 2000, meeting minutes:

The minutes of the February 28, 2000, Board meeting were presented to the Board for consideration. Whereupon, Dr. Jenkins moved and Dr. Snyder seconded that the minutes of the February 28, 2000 Board meeting, as written, be adopted and the motion passed unanimously 4 to 0.

The minutes of the April 3, 2000, Board meeting were presented to the Board for consideration. Whereupon, Dr. Jenkins moved and Dr. Snyder seconded that the minutes of the April 3rd Board meeting, as written, be adopted, and the motion passed unanimously 4 to 0.

2. Budget Report:

The Board was informed that the Environmental Quality Board and the Air Quality Board are going to receive $11,000 in additional emergency funding from the Division of Environmental Protection in order to assist the Boards this fiscal year. Ms. Coleman is currently preparing the fiscal year 2001 budget which must be submitted by May 1, 2000, but believes that the Board will continue to have

budget problems during the next fiscal year. The Board then discussed potential solutions to the Boards' budget problems.

3. Personnel Matters:

The Board was informed that the Kathy Coleman's ninety day evaluation has been completed.

4. Meeting Dates:

The Board set Environmental Quality Board meetings for June 1st, June 2nd, and, June 30th, 2000.

In addition, in order to meet the September 1, 2000, deadline for filing proposed Legislative Rules, the Board must file a Notice of Public Hearing on July 3rd, hold the Public Hearing on August 3rd, August 16th will be the deadline for filing written comments and the Board should hold a meeting to finalize the proposed rule on August 18th, 2000.

V. Other Business

Robert Foster, Chairman of the Air Quality Board met with the members of the Environmental Quality Board to discuss the future goals of the Boards. Goals discussed included a web page, staff training, computer and software upgrades, and additional technology. In addition, the Boards' Chairmen decided to meet on May 10th, 2000, to discuss solutions to budget issues. The members also discussed the Division of Environmental Protection's request that the Boards' offices be relocated to a space across the hall. The members determined that such a move would not be in the best interest of the Boards.

WHEREUPON, 4:00 p.m., Dr. Snyder moved and Dr. Samuel seconded that the April 21, 2000, Environmental Quality Board meeting be adjourned, and the motion passed unanimously 4 to 0.

I hereby certify that the forgoing is a true and correct record of the proceedings of the meeting held on April 21, 2000, by the West Virginia Quality Board. The minutes were approved by the Environmental Quality Board on June 1st, 2000.

Melissa Carte, Clerk

West Virginia Farm Bureau

Member of American Farm Bureau Federation

1 Red Rock Road, Buckhannon, WV 26201
(304) 472-2080 • 1-800-398-4630
FAX (304) 472-6554

February 25, 2000

Dr. Edward Snyder Chair
Ms. Libby Chatfield
Environmental Quality Board
1615 Washington Street
Suite 301
Charleston, West Virginia 25311-2126

Re: Iron and Aluminum

Dear Libby and Board Members:

West Virginia Farm Bureau (WVFB) represents some 14,000 farm families across the state. WVFB asks the Board that it allow time at the earliest meeting (March 10, 2000) for entertaining a presentation by Dr. Louis McDonald of West Virginia University on the issues relating to total iron and aluminum measurement as standards for impairment of state waterbodies.

He has in depth knowledge of the subject and WV specific understanding of the problems presented by a total metals standards. We are aware that Board time is limited, however we plan to present testimony for the record which could resolve Board and EPA differences with the standards and our issues as well. Some supportable change on an interim or permanent basis is sorely needed. We believe it will take at least 45 minutes for Dr. McDonald to address anticipated questions of the Board.

Dr. McDonald's curriculum vitae is attached. In the interest of time at the March 10 meeting, WVFB will be submitting a written statement in a day or two of this letter in lieu of any oral statments other than that of Dr. McDonald. All of our submissions, including Dr. McDonald's presentation is to be taken as a unit for purposes of our comments on triannual standards review.

Thank you and please advise.

Sincerely yours,

Sam P. Lockard

Sam P. Lockard

PS: Libby Pls see that each member of the Board receives a copy of the Curriculum Vitae.

EXHIBIT "A"

Curriculum Vitae

Louis M. McDonald, Jr.
Assistant Professor, Environmental Soil Chemistry
Division of Plant and Soil Sciences

1102 Agricultural Sciences Building
P.O. Box 6108
West Virginia University
Morgantown, WV 26506-6108

(304) 293-6023
lmcdona4@wvu.edu

Education

Ph.D., Soil Science, University of Kentucky, Lexington, KY, 1998

M.S., Agronomy, Louisiana State University, Baton Rouge, LA, 1992

B.S. Economics, California Polytechnic State University at San Luis Obispo San Luis Obispo, CA, 1989

Experience

Assistant Professor, Division of Plant and Soil Sciences, West Virginia Univ. 1997-present.

Graduate Research Assistant. Dept. of Agronomy, Univ. of Kentucky, 1992-1997

Graduate Research Assistant. Agronomy Dept., Louisiana State Univ., 1989-1992

Grant Proposals

McDonald, L.M. and Y.J. Chang. 1999. Reuse of AMD Sludge. U.S. Geological Society - Water Resources Research Institute. $37,054. Accepted, funding pending.

McDonald, L.M. and T. Vandivort. 1999. Simultaneous Sorption of Metals and Organic Chemicals to High Carbon Ash. Dept. of Energy. $216,363. Preproposal accepted, full proposal in preparation - due Jan 12, 1999.

Kotcon, J.B., W. Bryan, L.M. McDonald. 1999. Transition Methods to Convert from Conventional to Organic Agricultural Systems. USDA/NRICGP. $103,329. Funded.

Kotcon, J.B., et al. 1999. Systems of Transition from Conventional to Organic Agricultural Production. Northeast Region SARE/ACE. $402,363. Funded.

McDonald, L.M. and J. Skousen. 1998. Removal of Iron from Acid Mine Drainage by Open Limestone Channels. National Research Center for Coal and Energy, $21,880. Funded.

McDonald, L.M. 1998. Hormone Sorption to Soil Components. WVU Senate Research Grant, $7,625. Funded.

McDonald, L.M. 1998. Effects of Complex Mixtures on the Chemical and Physical Properties of Soils and Soil Materials. CSREES Hatch Proposal, $51,264. Funded.

Skousen, J.G., D.K. Bhumbla, J.C. Sencindiver, and L.M. McDonald. 1998. Control of Nonpoint Source Pollution from Land Application of Wastes. CSREES Hatch Proposal, $26,500. Funded.

Manuscripts Published

Morrison, J.T., R.G. Diener, L.M. McDonald, B. Bearce, C.H. Sansoucie. Effect of lime (soil pH) and soil texture on remediation of oil contaminated soil. Soil and Groundwater. Accepted.

Evangelou, V.P. and L.M. McDonald, Jr. Influence of sodium on soils of humid regions. Handbook of Plant and Crop Stress. Marcel Dekker. In Press.

McDonald, L.M. Jr., V.P. Evangelou and P.M. Bertsch. 1998. The potential role of sediment mineralogy in regulating aluminum concentrations in lakewater. Water Air and Soil Pollution. 104:41-55.

Evangelou, V.P., L.M. McDonald, Jr., and A.K. Seta. 1998. Acid Mine Drainage: Chemistry, Prediction and Prevention. In R.A. Meyers (Ed.) Encyclopedia of Environmental Analysis and Remediation. p. 1-17. John Wiley & Sons, Inc., NY.

Workman, S.R., S.E. Nokes and L.M. McDonald, Jr. 1998. A five-year study of atrazine and alachlor dissipation from a Fluventic Hapludoll. Environ. Sci. Technol. 32:1462-1465.

McDonald, L.M. Jr. and V.P. Evangelou. 1997. Optimal solid-to-solution ratios for organic chemical sorption experiments. Soil Sci. Soc. Amer. J. 61:1655-1659.

McDonald, L.M. Jr. and S.B. Milligan. 1994. Field evaluation of check plot adjustments to control environmental heterogeneity in an unreplicated sugarcane trial. J. Am. Soc. Sugar Cane Technol. 13:40-52.

Abstracts

Prima, S., V.P. Evangelou and L.M. McDonald, Jr. 1997. Mechanisms of interactions between a hydrophilic surfactant polyether-Brij 35-atrazine complex and 2:1 clay interlayers. American Chemical Society.

Eckland, A.M., L.M. McDonald, Jr. and V.P. Evangelou. 1995. Sensitivity of Kentucky lakes to acidic inputs. P. 222 Agronomy Abstracts. ASA Madison, WI.

Bacon, A.M., L.M. McDonald, Jr. and V.P. Evangelou. 1994. Kinetics of manganese

oxidation employing a pH-stat technique. P. 254 Agronomy Abstracts. ASA Madison, WI.

McDonald, L.M. Jr., V.P. Evangelou and J. Wang. 1993. Differences between infrared spectra of atrazine under transmittance and diffuse reflectance modes. P. 231 Agronomy Abstracts. ASA Madison, WI.

McDonald, L.M. Jr. and S.B. Milligan. 1991. Controlling environmental effects in unreplicated sugarcane trials. P. 105. Agronomy Abstracts. ASA Madison, WI.

McDonald, L.M. Jr., J.L. Kovar and S.B. Milligan. 1991. Determination of selenate and sulfate uptake kinetics for tall fescue in solution culture. P. 131 Agronomy Abstracts. ASA Madison, WI.

McDonald, L.M. Jr. and S.B. Milligan. 1990. Methods to control environmental heterogeneity in unreplicated testing in the Louisiana Sugarcane Variety Development Program. Sugar y Azucar. 85(6):26.

McDonald, L.M. Jr. and S.B. Milligan. 1990. Methods to control environmental heterogeneity in unreplicated sugarcane trials. P. 100 Agronomy Abstracts. ASA Madison, WI.

Teaching

AGRN 416 Soil Chemistry (3 credits) Spring 1998 (enrollment 9); Spring 1999 (enrollment 4).

AGRN 210 Soil Fertility (3 credits) Fall 1997 (enrollment 24); Fall 1998 (enrollment 14), Fall 1999 (enrollment 14)

Invited Speaker: WVU Extension Service Nutrient Management Workshop. The Chemistry and Biology of Soil Nitrogen. March 25, 1999

Invited Speaker: WVU Extension Service Fundamentals of Nutrient Management Training Course. Soil Aci.dity and Liming. July 8, 1999; Jan. 13, 2000

Prepared three pamphlets, Unit Conversions, Chemical Unit Conversions, and Graphing Data for students needing a review in these areas.

Conducted three evening sessions for students needing reviews in 1) algebra, 2) unit conversions, and 3) chemical unit conversions on Sept. 9, Sept. 16, Sept 23, 1998, and Sept. 13, 20 and 27, 1999.

Guest Lectures AGRN 230 Soil Physics. Jan. 26, 1998 - Diffuse double layer, flocculation and dispersion (including laboratory). April 15 and 20, 1998 - Solute Transport.

Guest Lecture: GEOL 294 Geochemical Systems II. Surface chemistry/structure of

the solid solution interface with implications for flocculation/dispersion, sorption of metals and organic chemicals. Nov. 6 and 11, 1997

Invited Speaker: Nutrient Management Workshop. Are EPA Metals Standards for Bio-Solids Protective? Dec. 9, 1997

Workshops/Symposia Attended

Annual Meeting American Society of Agronomy. Salt Lake City, UT. Nov. 1 - 5, 1999

"Grant Writers' Seminar with S.W. Russell" WVU Faculty Development Session. Aug. 18, 1999

"Introduction to Authorware" WVU Faculty Development Session. Jan. 21, 1999

"Fearless Teaching: Dynamic Presentation Skills in the Classroom" WVU Faculty Development Session. May 11, 1999

West Virginia Surface Mine Drainage Task Force Meeting. Morgantown, WV. April 13-14, 1999.

Annual Meeting American Society of Agronomy. Baltimore, MD. Oct. 18-22, 1998

"Those Who Can, Teach: Outstanding Tips from Outstanding Teachers". WVU Faculty Development Session. Sept. 29, 1998

Northeast Regional Teaching Workshop. Sept. 10-12, 1998. Storrs, CN

Grantsmanship Seminar. Sponsored by College of Agriculture, Forestry and Consume Sciences. Sept. 2, 1998

U.S. Environmental Protection Agency and West Virginia Department of Environmental Protection Public Workshop on Total Maximum Daily Loadings (TMDLs). June 23, 1998

West Virginia Department of Environmental Protection Interagency Evaluation Tour - Mountaintop Removal. Charleston, WV. June 8-9, 1998

"Web-Based Instruction: Using Topclass to Build On-Line Courses". WVU Faculty Development Session. May 14, 1998

"Using Presentation Software to Enhance Instruction and Professional Presentations". WVU Faculty Development Session. May 13, 1998

Extramural Funding - Getting Started. WVU Faculty Development Session. May 13, 1998

"Using Electronic Reserves in Your Class Planning". WVU Faculty Development Session. Apr. 15, 1998

West Virginia Surface Mine Drainage Task Force Symposium. Morgantown, WV. Apr. 7-8, 1998

Full Text to Your Desktop: New Services from the WVU Library. WCU Faculty Development Session. Feb. 11, 1998

Electronic Research Resources. Nov. 3, 1997

Agriculture, Forestry and Consumer Science in the 21st Century 1001 Ag. Sciences Bldg. Oct. 30, 1997

World Food Day Teleconference. 1001 Ag. Sciences Bldg. Oct. 16, 1997

Service

Reader for the Division of Plant and Soil Sciences at the College of Agriculture, Forestry and Consumer Sciences Honor's Convocation. Apr. 16, 1999

Member of Division Committee to prepare and present information at University Career Day, Oct. 20.

Division Representative to the College of Agriculture, Forestry, and Consumer Sciences Library Committee. 1999-2000.

Member of West Virginia Nutrient Management Examination Committee. 1999-2000.

Member of the Process Action Team for Strengths, Weaknesses, Opportunities and Threats - Benchmarking, a subcommittee of the College Strategic Planning Process 1998

Advisory/Consulting Activities

Technical reviewer for Journal of Environmental Quality

Evaluation of a wastewater spray field at Knouse Foods, (Berkely County WV). At the request of West Virginia Department of Environmental Protection. May 4 (With J. Sencindiver).

Appalachian Clean Streams Initiative Tour - Raccoon Creek Watershed - Athen, OH. Visited six sites impacted by acid mine drainage and made recommendations for treatment. April 21-22 (With J. Skousen, P. Ziemkiewicz).

Assess changes in stream water quality and sedimentation in Guyses Run due to discharges of treated mine water. At the request of West Virginia Department of

West Virginia University

College of Agriculture, Forestry and Consumer Sciences

Division of Plant and Soil Sciences
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FEB 17 2000
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

February 14, 2000

Dr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, WV 25311

Re: Total vs. dissolved criteria for iron and aluminum in surface waters

Dear Dr. Snyder,

Mr. Sam Lockard of the West Virginia Farm Bureau and I recently discussed the rationale for a dissolved vs. total iron and aluminum criteria for surface waters impacted by agriculture. I explained that because it was the dissolved metals that were toxic, the dissolved metals should be measured. Mr. Lockard then asked if I would share my expertise on this subject with the Environmental Quality Board.

There are four general forms of iron and aluminum in a stream (or soil). First, the iron and aluminum can be an integral part of stable, crystalline minerals like clays. Second, the metals can be precipitated as amorphous or crystalline oxides, either as discrete phases or in the interlayer of clays. Third, the metals can be bound to organic matter or mineral surfaces. Fourth, the iron and aluminum can be dissolved. The dissolved component includes both the free monomeric metal ion (Al^{3+}) and any metal complexed to inorganic ligands (e.g. AlF^{2-}, $Al(OH)_4^-$) or dissolved organic matter. The sum of all these forms represents the 'total' iron and aluminum content of the stream.

Because clays are generally insoluble, even in strong acid, the iron and aluminum in their structures is not considered available, except over geologic time scales. The 'total available' iron or aluminum in a stream then exists as either oxides (amorphous or crystalline), surface bound (mineral or organic), or dissolved.

The distribution of metals within the 'total available' phase is controlled by pH and the presence of inorganic or organic ligands. If you consider the concentration of ligands as relatively constant, pH is the most important factor. Iron and aluminum have a minimum solubility (that is, most of the 'total available' metal is either surface bound or precipitated) at circumneutral pH. As the pH either increases or decreases from this minimum, the amount of metal in the oxide and surface bound forms decreases and the amount in the dissolved form increases.

Although nearly all of the iron and aluminum in the 'total available' phase is acid soluble, only a fraction of this amount is 'biologically available'. It is widely accepted in the scientific literature that the free, monomeric metal ion is the form toxic to plants and animals, not the complexed, precipitated or surface-bound forms. The concentration of free metal ion is controlled by pH, increasing exponentially as pH decreases. In fact, the reason pH is regulated in surface waters is not because of the toxicity of the hydrogen ion itself, but rather the effect the hydrogen ion (pH) has on the availability of other metals.

Oxide and surface bound iron and aluminum are common in soils and sediments in West Virginia. This iron and aluminum can be mobilized to the dissolved form by acid mine drainage, industrial acid or ligand discharges, or by improper sample collection. When metals are to be determined, it is customary to acidify water samples after collection for transport to the laboratory. This is done to keep the metal ions from adhering to the walls of the collection vessel and to prevent metal precipitation before analysis. If the sample is not filtered before acidification, any iron or aluminum present in oxide or surface-bound forms will dissolve and become a free, monomeric metal ion. The effect of this acid dissolution of an unfiltered sample is to overestimate the 'biologically available' metal concentration in the stream.

There is ample scientific evidence to support the use of a dissolved standard for metals in surface waters impacted by agriculture. I understand that the Environmental Quality Board will meet again on February 28. If you have any questions or would like

clarification of any of these points, I would be happy to meet with you and the Board either before or during your meeting.

Sincerely,

Louis M. McDonald, Jr.
Assistant Professor, Environmental Soil Chemistry

West Virginia Farm Bureau

Member of American Farm Bureau Federation

1 Red Rock Road, Buckhannon, WV 26201
(304) 472-2080 • 1-800-398-4630
FAX (304) 472-6554

February 29, 2000

Dr. Edward M. Snyder, Chair
Ms. Libby Chatfield
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311

RECEIVED
MAR 2 2000
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Re: Iron and Aluminum-Stream Acidity

Dear Ms. Chatfield and Environmental Quality Board Members:

Please consider comments and evidence we present in their entirety for purposes of: (1) immediate review of the iron and aluminum standards; and (2) tri-annual review of the above standards. West Virginia Farm Bureau ("WVFB") does not itself ask for time at the forthcoming March 10, 2000 meeting, but does ask for time to hear Dr. Louis McDonald of West Virginia University. With my earlier letter of February 25, 2000 asking for March 10 agenda time, I furnished his curriculum vitae to accompany a written statement he sent directly to the Environmental Quality Board ("the Board"). Sufficient copies of all documents are enclosed for immediate mailing to Board members for review prior to March 10.

WVFB now has a previously unappreciated interest in iron and aluminum because of the West Virginia Department of Environmental Protection ("DEP") extensive listings of streams for those metals in total form. The metals lie on the bottom for the entire length of almost all streams in the state, and erode from soils and streambanks. The United States Environmental Protection Agency ("EPA") has requested, and now the constituency of WVFB ask the Environmental Quality Board to make adjustment to an acceptable standard to evaluate these two metals. Our membership consists of some 14,000 farm family members. Many of which live on waters affected. Had we been aware of the effect upon agriculture, we would have asked for opportunity to provide input and assistance to the Board at a much earlier date.

The question is not whether a change in analysis method of the two metals is necessary either on a permanent, or at a minimum on an interim basis, but is rather how do we accomplish it? We believe even with a short time frame we can assist to supplement the existing Board record and understanding of the subject to render it legally sufficient to resolve the concerns we have and those of EPA with current

standards. The extant record of Board is replete with years of evidence on these metals. West Virginia University through Dr. McDonald can furnish additional high quality West Virginia focused evidence. We have found that using a "total" vs. "dissolved" has resulted in faulty listings and will result in future such listings. TMDLs will be based upon violation of a meaningless "standard or numeric criteria" as opposed to listings for true "impairment".

We have not quantified the miles of streams presently erroneously listed as metals' impaired nor can we speculate on the number of miles of streams in West Virginia which could be so listed. We have heard estimates up to and over eighty-five percent of WV streams could carry total iron and aluminum over the numbers presently allowed. We do not know the history of the total metals standard, except we have learned it arose early in water quality remediation activities, and has now been long superseded by better scientific knowledge. Continuing the existing faulty process will leave the state confronted with an unrealistic and unmanageable number of improperly listed streams.

We have investigated the "total" vs. the "dissolved" metals fraction issue, inquiring of everyone we could familiar with the subject and accessible within the state as to why our streams would be impaired by naturally occurring iron and aluminum. The metals are ubiquitous, being the number one and two metals existing in the earth's crust. Our inquiries included our state agencies involved in water study, analysis, and remediation issues. The unanimous response was that the "total" criteria was meaningless. Apparently WV has some soils which carry even greater naturally occurring amounts of those metals than other soil types.

The level of stream acidity governs. If there is a neutral pH range, there is no toxic metals' problem. We turned to West Virginia University for assistance in obtaining answers and confirmed that acidity is the key. We were also fortunate to find Dr. Louis McDonald. He is one of the few people who has more than adequate knowledge of the science and chemistry of soils and water to address the issue, and also has in-depth research-specific knowledge to our state. Of all experts, including those available on a nationwide spectrum who might address the Board, he would probably be the most qualified to make a presentation and be able to answer questions specific to West Virginia. Note his extensive work in our state with stream acidity.

Dr. McDonald has made it clear from the beginning that he would not assist unless we could accept only science in any involvement he might have. He willing to give the Board time and expertise on an unpaid basis. Our discussions with him have

been on a no-fee arrangement. We suggest the Board itself verify his credibility and neutrality for the record.

The Board already has received evidence in past years in the form of aquatic or benthic studies by our Office of Water Resources that total aluminum did not affect stream life. Iron is almost identical in behavior.

We were told that total iron and aluminum are "at times" a surrogate for sediment. There is no West Virginia standard for sediment. If total metals are to be used to ascertain sediment levels, resulting in extensive and very costly legal and regulatory effects, then scientific evidence is legally mandated to justify a Board approved specific numeric translator criteria so as to define for itself and the public when those "at times" occur. Our DEP is on public record with the state TMDL committee in more than one instance that it employs benthic studies, *not iron and aluminum*, to evaluate sediment. Although there may be other arguments for a total metal measurement other than as an "at times" sediment indicator, we were apprised of no other justification during our investigation.

The Board has verbally expressed the need for science on the issue of dissolved aluminum. WVFB asks for time before the Board for Dr. McDonald to present science on both the iron and aluminum issues, and the subject of permanent or interim standards. If time does not allow for addressing questions the Board may have, we would hope to arrange for provision of subsequent information, such as written questions from the Board to be responded to in ample time to be made part of the record.

It is extremely important for the Board charged with a public responsibility to realize that where streams are designated as impaired for a naturally occurring (and from all information available to us a *harmless)* item in an unmanageable and inexhaustible supply, the problem will never be resolved. On analysis, the Board has deemed rainfall an impairment as total iron and aluminum will be present in the amounts nature determines after every event of precipitation. Leaving the status quo dooms total iron and aluminum targeted streams to the risk of a state of *impairment in perpetuity*, no matter how much time passes or monies expended in remediation attempts. Common sense mandates removal of the specter of wholesale designation of streams for erroneous iron and aluminum impairment to a status based in science.

Prior approval by EPA of any change would be desirous, however it is not essential to an attempt at a more scientific standard. We understand the legal role of that federal agency is to review after the fact and approve what West Virginia has done based on science. So long as the Board is satisfied any change is sufficiently protective, a

rationality based alternative method can be later amended to accommodate EPA concerns.

Change needs to be accomplished now, not after time allows for more faulty sampling and listings. This Board itself is faced with financial uncertainty. Continuing as is compels our DEP to expend its scarce funds with results that have unjustified-burdensome "snowball" economic effects on the State Office of Water Resources, DEP, EPA, and our citizenry.

Lastly, it is apparent that our constituents, the state agricultural industry, consider impairments and costly stream remediation for total iron and aluminum, which has been here since earth commenced and will end, to be beyond comprehension.

Respectfully,

Sam P. Lockard

Sam P. Lockard
Natural Resources Coordinator

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February 24, 2000

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FEB 25 2000
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Dr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311

Dear Dr. Snyder,

At the request of the West Virginia Manufacturers Association, I have prepared this letter which outlines my concern with the use of total recoverable aluminum concentrations to implement USEPA's Ambient Water Quality Criteria (AWQC) for aluminum (USEPA 1988). My review of the scientific literature leads me to conclude that total recoverable Al (usually similar to "acid-soluble" as actually used in the AWQC document) is not the most appropriate chemical fraction for predicting bioavailable concentrations of Al, or for use in comparing natural water Al concentrations against AWQC values for regulatory purposes. Below I outline my arguments in support of this concern[1], with most of the supporting evidence being drawn from a critical review I published recently in *CRC Critical Reviews in Environmental Science and Technology* (Gensemer and Playle 1999). Particularly important additional references will be cited below as needed; detailed references can be found in this review paper, or can be provided upon request.

1. **Bioavailable Aluminum Species**

The bioavailability of aluminum is highly dependent on water pH, which in turn is the primary factor controlling the relative concentrations of dissolved vs. particulate Al. Because Al is an amphoteric metal, it is most soluble at both acidic and basic pH, with minimum solubility occurring over a pH range of about 6–8. Soluble (i.e., monomeric) Al species include the free aquo ion Al^{3+}, simple dissolved Al hydroxides, and other simple inorganic (i.e., Al-fluoride) or organic complexes (i.e. Al complexation to dissolved organic matter or DOM). Insoluble Al largely consists of the polymeric $Al(OH)_3$ (gibbsite) or more complex polymeric cations that form under certain conditions (Sposito 1996).

For Al to be toxic, it must exist in a chemical form that is biologically available and that is capable of initiating the biochemical or physiological events that inhibit growth, disrupt normal physiology, or cause mortality. For most aquatic organisms, Al toxicity results from one of two basic mechanisms. First, a dissolved inorganic form of Al—most probably Al^{3+}—can bind to membrane surface ligands, thereby disrupting ionoregulatory systems or other membrane transport mechanisms. This mechanism is usually used to help explain toxicity in acidic waters. A second mechanism impacts fish living in waters of moderately acidic water (ca. pH 6–7), and involves respiratory distress induced by dissolved Al precipitating onto gill surfaces (owing to

[1]I also have concerns over the scientific validity of the chronic criterion concentration (87 µg/L), but this is beyond the scope of the present letter.

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EXHIBIT "B"

the gill pH microenvironment), thereby blocking normal gas transfer across the gill membrane. Some forms of insoluble Al (i.e., Al_{13} polycation) have been reported to induce toxicity directly, but the relative significance of this mechanism in natural systems is only poorly known. Therefore, the best scientific evidence to date suggests that dissolved aluminum species are the forms that are most bioavailable to aquatic organisms, and are thus the best chemical forms to use in predicting toxicity or in comparing exposure levels to regulatory criteria.

2. Total Recoverable Aluminum as a Predictor of Bioavailability

As you know, total recoverable metals measurements are often used to compare environmental exposures against AWQC levels ("acid-soluble" is used in the Al criteria, and is chemically similar in many cases), despite broad consensus by the EPA and the general scientific community that dissolved metal concentrations more closely represent the bioavailable fraction of metals in surface waters (USEPA 1993). The use of total recoverable measurements is particularly problematic for Al, given the large of amounts of insoluble—and, hence, poorly available—Al present in freshwater over the pH range represented in the AWQC (6.5–9). Furthermore, given that current scientific evidence best supports dissolved Al as the most bioavailable chemical fraction, total recoverable Al concentrations will be poor descriptors of toxicity, particularly across a broad spectrum of pH values.

To illustrate that total recoverable Al is a poor predictor of toxicity to aquatic organisms, the pH dependent toxicity of Al to freshwater microalgae was reviewed (Gensemer and Playle 1999) and is summarized below. If "total" Al is used as the analytical measurement in single-species toxicity studies, no trend in toxicity as a function of pH can be observed. Intuitively, Al should be more toxic at low pH given exposure to a fixed total Al pool (Al_T), because the presumably most toxic soluble forms of Al (inorganic monomeric) become increasingly more abundant as pH values drop below 5.5. However, if all the studies from which EC50 values could be obtained are examined as a group (Fig. 1—adapted from Gensemer and Playle 1999), no simple monotonic or linear relationship can be observed between pH and algal EC50s (as a function of log-transformed total Al). This is also the case for Al toxicity data from the most recent data in the AQUIRE database, and from acute data from the AWQC document itself (Gensemer et al. 1999).

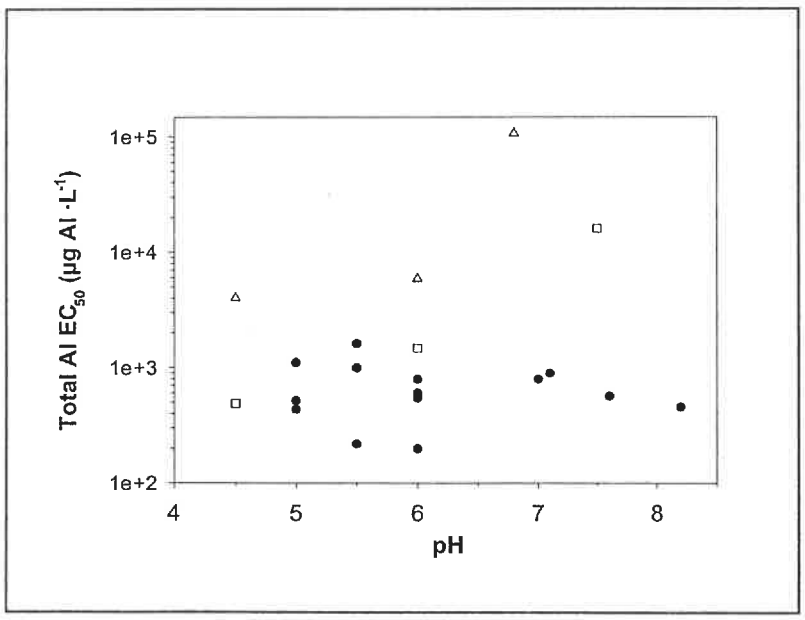

Figure 1: Total Al toxicity to microalgae as a function of pH

3. Dissolved Aluminum as a Predictor of Bioavailability

Dissolved Al is clearly a more appropriate operational chemical fraction with which to predict bioavailable levels of Al, or against which AWQC

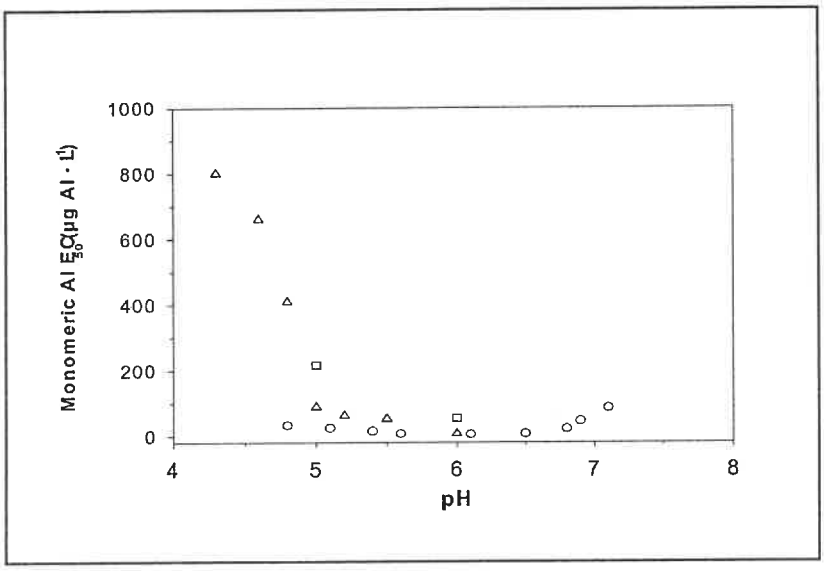

Figure 2: Dissolved Monomeric Al Toxicity to Microalgae as a function of pH

concentrations should be compared. Dissolved Al fractions contain the chemical species most widely regarded as being bioavailable (i.e., Al^{3+}, monomeric hydroxides), and thus is a better predictor of toxicity from a mechanistic point of view. This is certainly known to be the case at acidic pH, and is also likely to be true at pH values > 8 where $Al(OH)_4^-$ becomes more abundant. However, essentially no scientific data are available to confirm the toxicity of dissolved Al owing to $Al(OH)_4^-$ at high pH.

The example given above using total Al data can be extended to help illustrate how dissolved Al can be a superior predictor of toxicity across a wide spectrum of pH conditions. In contrast to the situation with total Al, algal toxicity studies exhibited more consistent trends relative to pH if dissolved monomeric Al is used as the measure of exposure. In the few studies for which such data exist, a remarkably consistent trend between pH and toxicity can be observed, even though two different taxa and three different exposure media were used (Fig. 2—adapted from Gensemer and Playle 1999). This plot suggests a curvilinear relationship whereby toxicity is maximal at pH 6 with monotonic decreases in toxicity as pH approaches both 4 and 7. Even more striking is the apparent relationship between free Al^{+3} and H^+ ion activity. Even though only a very few investigators have estimated Al^{+3} ion activity from monomeric Al measurements, when EC30 or EC50 values (using the -log of Al^{+3} activity, or pAl) are plotted as a function of pH, a strong (r^2 = 0.92) linear relationship can be observed between pH and Al toxicity (Fig. 3—adapted from Gensemer and Playle 1999). Although these data

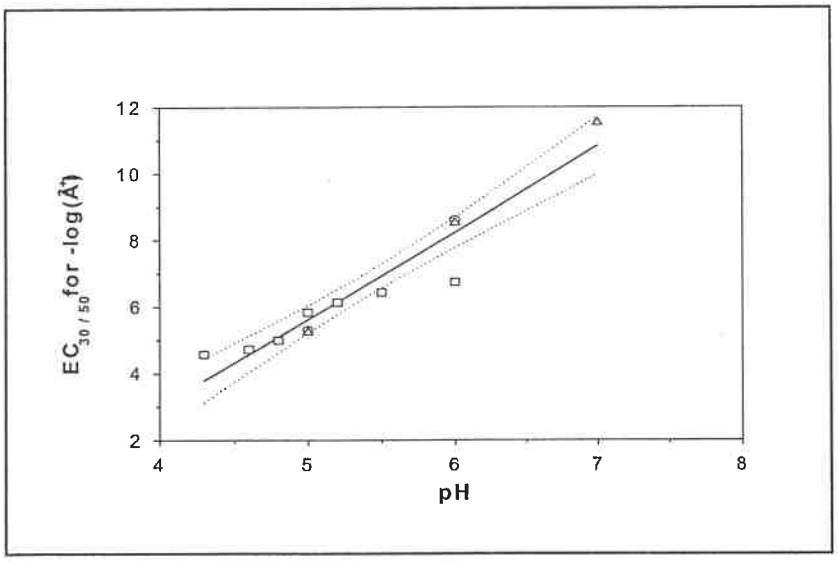

Figure 3: Free Al^{3+} ion toxicity to microalgae as a function of pH.

are limited only to an acidic pH range (≤ 7), this strong relationship suggests that free Al^{+3} ion activity could be an excellent predictor of Al toxicity in algae. Given other evidence supporting the Al^{3+} ion as a predictor of toxicity in aquatic animals (see Gensemer and Playle 1999), this species may be the best overall predictor of toxicity in aquatic organisms (although see Campbell 1995 for limited exceptions). If future scientific study continues to support this view, dissolved Al *per se* may even be a somewhat conservative predictor of toxicity given that dissolved Al fractions contain species other than Al^{3+} (depending on pH). At the very least, dissolved Al measurements clearly are superior predictors of toxicity compared to total, total recoverable, or acid-soluble (as defined in USEPA 1988) Al measurements.

Please let me know if you have any questions regarding my comments in this letter, or if I can be of further assistance in this matter.

Sincerely,

Robert W. Gensemer, Ph.D.
Senior Ecotoxicologist and Program Manager

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Aluminum Water Quality Standards

Examples of Implementation Procedures for Dissolved Criteria

As set forth previously, detailed examples of how dissolved metals criteria are implemented in NPDES permits are set forth in the United Stated Environmental Protection Agency ("EPA") document entitled "The Metals Translator: Guidance for Calculating a Total Recoverable Permit Limit from a Dissolved Criterion" (June 1996). The following three examples set forth specific examples of how dissolved aluminum criteria might be implemented in West Virginia.

Example 1: Determination of Stream Compliance with the Aluminum Criteria

The Environmental Quality Board (the "Board") proposes to adopt dissolved aluminum water quality criteria in its Water Quality Standards set forth in 46 CSR § 1. As set forth in §46-1-8.1.b., "[c]ompliance with aquatic life water quality criteria expressed as dissolved metal shall be determined based on dissolved metals concentrations." Accordingly, if the Board adopts dissolved aluminum criteria, then the compliance of a water body will be determined based on measurements of the concentration of dissolved aluminum in the water body. An EPA-approved method for measuring dissolved aluminum concentrations in water is set forth in Method 200.7 (40 CFR § 136, Appendix C). Dissolved aluminum most closely approximates the bioavailable form of aluminum.

To date, most aluminum water quality data for West Virginia waters has been measured as total recoverable aluminum concentrations. Additional data will need to be collected to determine the compliance of a lake or stream with the Board's dissolved aluminum criteria. DEP has established minimum data requirements necessary to determine whether a stream is impaired for a certain parameter. Once this data is collected, any stream which does not meet the Board's dissolved aluminum criteria should be placed on West Virginia's 303(d) List of impaired streams.

Based on the data DEP collected in 1998, it is also possible that some streams may be removed from the 303(d) List of impaired streams with the adoption of dissolved aluminum

criteria. As in the many toxicity studies which have been performed with aluminum, DEP's data corroborates that all or most of the aluminum in waters with a circumneutral pH is in a particulate or nondissolved form. Accordingly, many of the streams assessed by DEP with a pH in the range of 6 to 9 have nondetectable concentrations of dissolved aluminum.

On the other hand, most of the streams assessed by DEP with an acidic pH, as with streams impaired by acid mine drainage or acid deposition, had elevated concentrations of dissolved aluminum and would be considered impaired based on dissolved aluminum criteria. These streams would be properly listed on the 303(d) List of impaired streams.

Generally, the implementation of dissolved aluminum criteria will require data to be collected to determine a stream's compliance with the criteria. This is an important step in the process of focusing 303(d) listing and the preparation of TMDLs to those streams which are truly threatened by elevated concentrations of the toxic form of aluminum.

Example 2: Preparation of Water Quality-Based Effluent Limits in the Absence of a TMDL

Undoubtedly, a number of water bodies in West Virginia will exceed the Board's dissolved aluminum criteria. Others will have concentrations of dissolved aluminum which approach the aluminum criteria and which may be affected by the discharge of dissolved aluminum by an NPDES permittee. In each of these instances, the preparation of water quality-based effluent limits for an NPDES permittee may be appropriate when a TMDL has not been prepared for the receiving water body. The following example is intended to be an illustration of how this may be done by DEP. However, this is not intended to imply that this is the only appropriate method for determining water quality-based effluent limits.[1]

Following the adoption of dissolved aluminum criteria in West Virginia, the water quality of Stream B is assessed. Due to a low pH, Stream B has average concentrations of dissolved

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[1] In particular, this example is not intended to address how water quality-based effluent limits might be prepared with the application of an antidegradation policy.

aluminum of 80 g/l. While Stream B does not exceed the acute or chronic aluminum criteria, its concentrations are very near the chronic criterion. Stream B also has a very low flow.

A new facility applies for an NPDES permit to discharge water into Stream B. The new facility will discharge dissolved aluminum as part of its water treatment process. It is determined that, because of the low flow in Stream B, the discharge of dissolved aluminum by the facility is likely to affect the water quality in Stream B. DEP determines that it is necessary to issue water quality-based effluent limits in the new facility's NPDES permit to protect Stream B.

NPDES permit limits must be set as total recoverable concentrations. Accordingly, a translator must be applied to convert the dissolved aluminum criteria into total recoverable permit limits. As a general rule, a translator of 1 can be applied to generate the most conservative permit limits. In effect, applying a translator of 1 assumes that all aluminum to be discharged by the NPDES permittee is in the dissolved form. A permittee may also elect to prepare a site-specific translator. The procedure, which is outlined in detail in the translator document, involves collecting extensive water quality data on the receiving stream and on the proposed effluent. The burden for preparing a site-specific translator is placed on the proposed permittee.

In this instance, DEP applies a translator of 1 to convert the dissolved chronic criterion to a total recoverable aluminum permit limit of 87 g/l. The new permittee determines that this permit limit is acceptable and opts not to develop a site-specific translator. Accordingly, DEP imposes a water quality-based aluminum effluent limit of 87 g/l as a total recoverable aluminum concentration in the NPDES permit.

Example 3: Preparation of Water Quality-Based Effluent Limits from a TMDL

A number of streams in West Virginia are anticipated to require the preparation of TMDLs to bring the streams into compliance with dissolved aluminum criteria. In particular, streams impaired by acid mine drainage or acid deposition may require the preparation of TMDLs. The example set forth below illustrates how a TMDL may be prepared on a stream impaired by acid

mine drainage. It is not clear how responsibilities will be allocated between pre-1977 mines covered under the Abandoned Mine Lands (AML) program and active mines discharging under a valid NPDES permit. However, this example assumes that some reductions are necessary from NPDES permittees.

Stream C is impaired by acid mine drainage from AML mines. Because of this, Stream C has concentrations of dissolved aluminum well in excess of the aluminum criteria in West Virginia's Water Quality Standards. Stream C is listed on the 303(d) List of impaired streams and is scheduled for development of a TMDL.

When the TMDL is prepared for Stream C, the modeling indicates that significant reductions must be made in the aluminum discharges from both active mines and AML mines discharging into Stream C. The TMDL allocates a wasteload allocation to each mine discharging into Stream C. This wasteload allocation is then implemented as enforceable discharge limits in the NPDES permits for the active mines on Stream C.

Because the wasteload allocation is established in terms of dissolved aluminum, a translator must be applied to convert the wasteload allocation to a total recoverable effluent limit. To accomplish this, either a general translator of 1 may be applied, or a site-specific translator may be developed by the NPDES permittee.

EXHIBIT "C"

WEIRTON STEEL FINANCIAL AND SOCIOECONOMIC EFFECTS OF COMPLIANCE WITH WV WATER QUALITY REGULATIONS AT HARMON CREEK.

**This document has been moved to the May 11, 2000, Board meeting minutes because that is when the final determination on the variance was made.

EXHIBIT "C"

WEST VIRGINIA RIVERS COALITION

April 14, 2000

Dr. Edward Snyder, Ph.D.
Chairman
W.Va. Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, WV 25311-2126

RE: Blackwater River Use Re-Designation

Dear Dr. Snyder,

The West Virginia Rivers Coalition (WVRC) has several concerns regarding the request made February 11, 2000 by the Blackwater River Watershed Association (BRWA) to the W.Va. Environmental Quality Board (EQB) pertaining to the proposed meeting in Canaan Valley.

This meeting and site visit request seems an unsuitable petition in the precedent that it would set for the EQB. Each issue and party who appears before the EQB may then desire a site visit and review of their own, stressing the time commitments and availability of the EQB and its members, and the other items on the EQB's already full plate.

It also appears particularly inappropriate for the BRWA to openly offer payment to the EQB for expenses incurred upon such a visit. This, and the offer to assume the expenses for the proposed meeting, when the BRWA has a request and decision pending with the EQB, is a most egregious proposition. This may, in fact, result in the appearance of a conflict of interest for the EQB.

EXHIBIT "D"

801 N. Randolph Avenue • Elkins, West Virginia 26241 • (304) 637-7201 • www.wvrivers.org
"Seeking the conservation and restoration of West Virginia's exceptional rivers and streams"

In closing, WVRC must state that should such a request for an on-site visit and tour of the Blackwater River be agreed to by the EQB, we will pursue an equal opportunity to meet separately with the EQB to discuss our position for maintaining the current designation, as well as an occasion to lead our own excursion through the river system and watershed.

Should you have any questions or comments upon our position regarding the request by the BRWA, or any other aspect of the Upper Blackwater River use re-designation, please do not hesitate to contact us at (304) 637-7201. We thank you for your time and attention to this matter.

Sincerely,

Bryan K. Moore

Bryan Moore, Vice Chair
Board of Directors
West Virginia Rivers Coalition

Jeremy P. Muller
Executive Director
West Virginia Rivers Coalition

DIVISION OF NATURAL RESOURCES
Wildlife Resources Section
Operations Center
P.O. Box 67
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Cecil H. Underwood
Governor

John B. Rader
Director

April 20, 2000

Dr. Ed Snyder, Chairman
WV Environmental Quality Board
1615 Washington Street East
Suite 301
Charleston, WV 25311-2126

Dear Dr. Snyder:

This letter is in reference to the Blackwater River Watershed Association (BRWA) evaluation of the January 2000 Division of Natural Resources report presented to the West Virginia Environmental Quality Board. We believe that some issues raised by the BRWA need clarification and/or explanation.

In the BRWA evaluation, it is stated that the Division of Natural Resources (DNR) said that they made an error in use designation for lower Blackwater. In reality, our report to the Board clearly states that given the conditions on lower Blackwater at the time of designation, the proper designation was made. At that time lower Blackwater was too polluted by acid mine drainage to support a trout population or to permit trout stocking. In the absence of trout, the appropriate designation was warmwater (B1). Only the development of new technology after designation provided an economical, dependable method to treat the acid mine drainage which allowed the trout population to be reestablished, thereby making designation appropriate.

As stated in our report and correctly quoted in the BRWA evaluation, it is and has been the DNR position that if a trout is present in late summer, the stream meets the coldwater (B2) requirement. This is based on the fact that the critical time for trout survival is during the maximum summer water temperature period. In addition, the presence of a trout in a fish survey, given the small percentage of a stream that can economically be sampled, strongly indicates that additional trout are present in the remainder of the stream. Summertime survival is the parameter used to designate coldwater streams from warmwater streams that are stocked with trout but not classified as coldwater.

In our report and correctly quoted by BRWA, we stated that water temperature was not used as a parameter to designate coldwater (B2) from warmwater (B1). While declared illogical by BRWA, it must be pointed out that the coldwater (B2) designation requirement does not

mention water temperature. The only requirement is a year round trout population. If the water temperature of a stream never exceeds 50° F but trout are not present, the stream cannot be classified as coldwater (B2).

In the Potesta Report and in the BRWA evaluation, several parameters are discussed in an effort to show that upper Blackwater River should not be designated coldwater (B2). It must again be pointed out that none of these parameters, other than the presence or absence of a year round trout population are relevant to the designation. If a stream has high water temperatures, no pools, no streamside cover, a mud bottom and a year round trout population, the stream would correctly be designated coldwater (B2).

Much of the debate associated with redesignation stems from what constitutes a year round population. While there are a multitude of definitions for population, we should use the one that best defines population in the context in which it was intended to be used. The DNR position is that the water quality standards established under the coldwater (B2) designation were designed to protect water quality to insure that trout could survive year round. While most agree that self-sustaining trout populations clearly meet the definition, the debate centers on streams that have trout present year round but where reproduction does not occur.

There is one major point missed by those that want to redesignate coldwater (B2) streams to warmwater (B1). It must be remembered that regardless of the source of the trout present in a stream, they have the same basic water quality requirements. A sufficiently low oxygen concentration will kill hatchery trout just as quickly as it will stream-spawned trout of the same species. For that reason, streams capable of supporting trout, any trout from any source, year round must be provided the same protection. To do less will result in the loss of trout from streams that presently support trout populations year round. We do not believe that the law was designed with that purpose as a goal.

The BRWA evaluation disagrees with the DNR statement that the coldwater (B2) designation is appropriate for the upper reaches even if no trout survived upstream of Davis. It must be pointed out that while there are provisions to allow different designations on a stream, it is not required. If any part of the stream can be designated coldwater (B2), the designation of the total stream as coldwater (B2) could be justified since streams must be designated the highest attainable use.

The EPA Report on upper Blackwater on page 26 states that "with all discharges and unused WLA's removed and the dams removed, the DO remains above the standard in all but the lowest three reaches (reaches 9-11, approximately five miles of the study area)." Keeping in mind that designation must reflect highest attainable use, this information suggests that the only section that could even be considered for redesignation is the above mentioned five-mile long section. The DO standard for coldwater (B2) is readily attainable for the remaining 18 miles.

Hopefully this letter will provide some additional clarification of our comments on the proposed redesignation of upper Blackwater. We do not believe that such redesignation can be justified nor would it meet the intent of the law.

If we can provide additional information, please let me know.

Sincerely,

Donald Phares
Assistant Chief Special Projects

DP:ke

cc: Bernie Dowler, Chief, Wildlife Resources

The Senate of West Virginia

Charleston

JON BLAIR HUNTER
1265 Four-H Camp Road
Morgantown 26508-2458

Res. (304) 291-3782
Bus. (304) 292-5826
Bus. Fax (304) 296-6494
Senate (304) 357-7995

COMMITTEES:
Education
Energy, Industry and Mining
Health and Human Resources
Judiciary
Labor (Vice Chair)
Military

March 1, 2000

RECEIVED
MAR 3 2000
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

Dr. Edward Snyder, Co-Chair
West Virginia Environmental Quality Board
1615 Washington Street East, Suite 301
Charleston, West Virginia 25311-2126

Dear Dr. Snyder:

I am writing in support of retaining the Trout and Cold Water (B2) Use designation of the Upper Blackwater River, Tucker County, West Virginia as defined by the West Virginia Water Quality Standards (46-1-2.19). The Upper Blackwater, and its associated tributaries, have a recognized existing use as trout waters and are subject to that use definition under the Clean Water Act. The Clean Water Act defines existing uses as those that have been attained at any time since November 28, 1975, when the Clean Water Act regulations regarding use designation were established. Existing uses include: 1) uses actually being made, whether or not the level of quality to support the use exists; and 2) uses for which the level of quality has been attained, whether or not the use is yet being made. At 131.12(*A*)(1) the Clean Water At regulations state flatly that "existing in stream water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected."

The Clean Water Act addresses the restrictions on the removal of designated uses by saying that:

> States may not remove designated uses if: 1) they are existing uses, as defined by Section 131.3 [of the regulations], unless a use requiring more stringent criteria is added; or, 2) such uses will be attained by implementing effluent limits required under Sections 301(b) and 306 of the Act and by implementing cost-effective and reasonable best management practices for nonpoint control. (40 *CFR* 131.10(h)).

Field observations as recent as November 1999 have confirmed that there are trout spawning in the Upper Blackwater River. Accordingly, the designated use of the Upper Blackwater River as a trout/cold water fishery must be maintained as both the designated and existing uses are currently being attained.

I thank you for your attention to this matter, and I am confident that as the Environmental Quality Board examines the designation of the Upper Blackwater River, it will maintain the trout/cold water fishery designation.

Sincerely,

Senator Jon Blair Hunter

HOUSE OF DELEGATES
WEST VIRGINIA LEGISLATURE

BUILDING 1, ROOM ~~M-212~~ E-213
1900 KANAWHA BLVD., EAST
CHARLESTON, WV 25305-0470
PHONE (304) 340-3192

VICKI V. DOUGLAS, Chair
COMMITTEE ON GOVERNMENT ORGANIZATION
1003 CHESTNUT DRIVE
MARTINSBURG, WV 25401
PHONE: (304) 263-1070

Committees:
House Rules

March 6th, 2000

RECEIVED
MAR 9 2000
ENVIRONMENTAL QUALITY BOARD
AIR QUALITY BOARD

John A. De Mars, President
Creekside Anglers, Inc.
2009 Ora Lee Court
Martinsburg, WV 25401

Dear Mr. De Mars:

Thank you for your recent letter regarding the reclassification of the Blackwater River. I was not aware of the change in designation and it certainly does not seem to be a sound decision, but I have very little information on which to base that judgement. However, I have enclosed the information given to one of the members of my staff from Mr. Bernard F. Dowler of the Wildlife Resources. You may need to communicate with him. Mr. Dowler can be reached at 558-2771.

Should you have any more questions or concerns, please feel free to call my office.

Sincerely,

Vicki V. Douglas

Vicki V. Douglas

VVD:ac

P.S. I have asked Libby Chatfield to keep me informed of the situation for you. V.

Issue: Blackwater River Reclassification

Spoke with Mr. Dowler of the Wildlife Resources and was informed of the following information:

Blackwater River divided into two (2) sections for classification

The **upper section** was designated as a cold water stream by the USEPA (trout can be found at anytime of the year)

The **lower section** was designated as a warm water stream due to high acid content.(opposite of cold water for trout)

A group has presented an UAA (use analysis) to the Environmental Quality Board for review. It requested that the **upper section** be designated as a warm water stream which would ease restrictions on the area and allow for development.

After the review the board's recommendation would be passed on to the USEPA for their decision to change it or not.

There is a second group in opposition to the first group.

The second group has requested that the **lower section** be redesignated as a cold water stream due to water quality over past few years and trout are now found there.

Any questions concerning Environmental Quality Board - Libby Chatfield

CREEKSIDE ANGLERS, INC.

2009 ORA LEE COURT
MARTINSBURG, WV 25401.....*A CHARTER CLUB OF THE FEDERATION OF FLY FISHER*

February 18, 2000

Mrs. Vicki V. Douglas
1003 Chestnut Drive
Martinsburg, WV 25401

Dear Delegate Douglas

We are communicating with you to inform you of our opposition to the reclassification of the Blackwater River as a warmwater stream thus removing its designation as a trout stream. The present designation, affirmed by action of the federal government, should not be reduced detrimentally by legislative action.

Thoughout time this stream has suffered the tribulations of logging operations, fires, and acid mine discharge and thereafter, due to determined action by the Department of Natural Resources and others, is making a comeback. The changing of the stream from coldwater (B2)** to warmwater (B1) status will invite development and degradation of a stream which is a majestic asset of our state.

Creekside Anglers, Inc. of Martinsburg is a fly fishing group which is a Charter Club of the national organization, the **Federation of Fly Fishers**. It consists primarily of residents of the Eastern Panhandle, but also those of nearby Maryland, and South Central Pennsylvania. In addition to actively pursuing our sport, we subscribe to the national's motto, "**Conserving, Restoring, Educating Through Fly Fishing**". Our aim is the education of youth and the protection of our precious resources; thus we have grave concerns when threats to our fragile environment occur as in this case. The membership of Creekside Anglers, Inc. took action in February to oppose changing the status of Blackwater as a coldwater stream (B2) and requested that you be contacted.

We wish to associate ourselves with the testimony of the Wildlife Resources group of WV DNR to the Water Quality Board in January 2000. In their statements they not only opposed any change in the designation of the section of the stream in question, but also asked that the protective designation of (B2) be extended to additional sections of the stream; this latter based upon DNR stream survey data of late last summer.

Once you have an opportunity to further inform yourself in regard to this matter, we request that you inform us of your position.

** A coldwater stream (B2) does not refer to stream temperature and is not defined that way. It is a stream where trout can be found at any time of the year.

Sincerely,

John A. De Mars

John A. De Mars, President
Creekside Anglers, Inc.

Mid-Atlantic Council Federation of Fly Fishers
All Fish
All Waters

Little Boyd Coal Co., Inc.

Application For Variance From Water Quality Standards For Remining Activities

Remining No. 1 Mine

Comparison of Existing Valley Fill to Proposed Valley Fill

	Existing Vf	Proposed VF
Type of Material	Shales and Sandstone	Shales and Sandstones
Acid Base Accounting	Material contains exess neutralization	Material contains exess neutralization
Type of Placement	End dump placement	End dump placement
Final Configuration	Slopes and benches	Slopes and benches
Water type	Comingles with Lower Cedar Grove	Covers Lower Cedar Grove

lr/99001 - VF Comparison

EXHIBIT "E"

Attachment 13-III-A & B

Abatement Plan and Reasons Chosen

The proposed permit area is located in an area where pre-law mining had occurred sometime in the early part of the 1900's. This pre-law mining was accomplished using "shoot and shove" mining methods. This "shoot and shove" mining by its very nature left the overburdens above the coal seam mined being placed on the downseam slope. In the area proposed to be remined, this prelaw method has created environmental problems. A major contributor to the Acid Mine Drainage (AMD) ia shale material that lays directly over the coal seam. This strata is approximately eleven feet in thickness and consists of a black shale. Since this material lies directly over the coal seam, it was the last overburden strata pushed over the hill and hence the principal overburden present on the surface of the slope below the coal seam. This overburden material is very alkaline deficient material and contributes to the deteriorated existing water quality in the present Lick Branch watershed.

There are abandoned deep mines present in the area to be mined in the Lower Cedar Grove Seam. These deep mines are seeping water in numerous places along the pre-existing highwalls. These discharges have very poor quality with low pH values and high manganese values contributing to the overall degraded stream water quality.

The abatement measures to be taken during the mining of this proposed operation will encompass practicable measures employing special handling of the AMD producing black shale strata[1] and the creation of valley fills to serve as a buffer to waters entering the streams.

The black shale encountered during the second cut remining that requires special handling techniques can be easily identified in the field due to the dark color of the shale and its location above the Lower Cedar Grove Seam. This will make it easier for the field operation persons to segregate this black shale during the material handling phase of the mining operation.

This black shale, where practicable, will be encapsulated within the backfill areas of the permit. A layer of sandstone type material will be placed upon the pit floor to a minimum thickness of ten feet. The black shale will be placed upon this pad so to keep it away from water that may migrate along the near impermeable pit floor. The black shale will be placed a minimum of ten horizontal feet away from the vertical highwall bottom so as to minimize effects from water that may migrate downward along the face of the

---

[1] Where practicable, the existing downslope material placed below the Lower Cedar Grove Seam will be segregated or blended with alkaline material. However, limitations resulting from safety, stability, economical or other concerns will preclude removal of some of this existing downslope placed material.

highwall. The black shale material will be covered with the remainder of material available for backfilling. The cover material will be reasonably compacted to help assure that water infiltration into the black shale material is minimized. The cover material will consist of the materials in the overburden that do not exhibit a potential to contribute to the generation of the AMD. As these materials weather, the fine particles will help to seal the AMD producing materials from rainwater in filtration. No acid producing black shale material uncovered during the mining of the Lower Cedar Grove Seam will be placed in any of the valley fills.

The black shale placed downslope from past mining in the Lower Cedar Grove Seam will be moved, where practicable, during any remining that may take place in the Alma Seam. This material at the very least will be mixed with over overburden materials during the mining process. The moving of this strata during any mining of the Alma Seam will cause a redistribution of the strata within the confines of the backstack or valley fill, thus bringing it in contact with other material that will have an excess of acid producing potential.

The creation of the valley fills is necessary and will serve as a buffer to help neutralize some of watershed drainage contributing to the preexisting degraded water quality. The location of the NPDES outlets show that the majority of the surface water flows from the proposed operation will be directed to and flow across and through a valley fill. This will help to aerate surface drainage in the open channels and any water infiltrates the valley fill will come in contact with some material with excess potential for neutralization. Because the valley fills are essential to achieving improved water quality and are an integral part of such plan, the material required for the valley fills preclude its use as material available for highwall reclamation. The material placed in the valley fills will be durable material contributing to the neutralization potential and water quality improvement of the water flow via either infiltration or overland surface water flow.

This abatement plan is the only practicable plan possible in this area. No known feasible options exist to improve the water quality in the area that does not include the mining of additional reserves in the area. Other options such as addition of fly ash from utility plants, limestone supplement and ammonia injection were considered. All of these options were either cost prohibitive or would require perpetual maintenance involving equipment and labor.

09/RM13III(revised for 4/21/00 meeting)

Natural Background Rule

7.2.c.4. ~~Where lesser quality is due to natural conditions. In such cases the naturally occurring values shall be the applicable criteria. Provided, That the existing and designated uses of downstream waters are not adversely affected.~~

Where, on the basis of natural conditions, the Board has established a site-specific aquatic life water quality criterion that modifies a water quality criterion set out in Appendix E of this rule. Where a natural condition of a waterbody is demonstrated to be of lower quality than a water quality criterion for the use classes and subclasses in Section 6 of this rule, the Board, in its discretion, may establish a site-specific water quality criterion for aquatic life. *This alternate criterion may only serve as the chronic criterion established for that parameter. This alternate criterion must be met at end of pipe.* Where the Board decides to establish a site-specific water quality criterion for aquatic life, the natural condition constitutes the applicable water quality criterion. A site-specific criterion for natural conditions may only be established through the legislative rulemaking process in accordance with W.Va. Code § 29A-3-1 et seq. and must satisfy the public participation requirements set forth at 40 C.F.R. 131.20 and 40 C.F.R. Part 25. Site-specific criteria for natural conditions may be established only for aquatic life criteria. *A public notice, hearing and comment period is required before site-specific criteria for natural conditions are established.*

Upon application or on its own initiative, the Board will determine whether a natural condition of a waterbody should be approved as a site-specific water quality criterion. Before it approves a site-specific water quality criterion for a natural condition, the Board must find that the natural condition will fully protect *existing* and designated uses. If a natural condition of a waterbody varies with time, the natural condition will be determined to be the prevailing highest quality natural condition of the waterbody measured during an annual season, or shorter time period before discharge or operation, or as the actual natural condition of the waterbody measured concurrent with discharge or operation. The Board will, in its discretion, determine a natural condition for one or more seasonal or shorter periods to reflect variable ambient conditions; and *require additional or continuing monitoring of natural conditions.*

An application for a site-specific criterion to be established on the basis of natural conditions shall be filed with the Board and shall include the following information:

a. *A U.S.G.S. 7.5 minute map showing the stream segment affected and showing all existing discharge points and proposed discharge point;*

b. *The alphanumeric code of the affected stream, if known;*

c. *Water quality data for the stream or stream segment. Where adequate data are unavailable, additional studies may be required by the Board;*

d. *General land uses (e.g. mining, agricultural, recreation, residential, commercial, industrial, etc.) as well as specific land uses adjacent to the waters for the affected segment or stream;*

EXHIBIT "F"

e. *The existing and designated uses of the receiving waters into which the segment in question discharges and the location where those downstream uses begin to occur;*

f. *General physical characteristics of the stream segment, including, but not limited to width, depth, bottom composition and slope;*

g. *Conclusive information and data of the source of the natural condition that causes the stream to exceed the water quality standard for the criterion at issue.*

h. *The average flow rate in the segment and the amount of flow at a designated control point an da statement regarding whether the flow of the stream is ephemeral, intermittent or perennial;*

i. *An assessment of aquatic life in the stream or stream segment in question and in the adjacent upstream and downstream segments; and*

j. *Any additional information or data tat the Board deems necessary to make a decision on the application.*

Chathela

To: Libby

From: Sally Brough
EPA, Region 10
206 553-1295

18 AAC 70
WATER QUALITY STANDARDS

As amended through January 22, 1999

Tony Knowles
Governor

Michele Brown
Commissioner

Alaska -
Natural condition
definition

~~Fower~~

(41) "natural condition" means any physical, chemical, biological, or radiological condition existing in a waterbody before any human-caused influence on, discharge to, or addition of material to, the waterbody;

(42) "nonpoint source" means a source of pollution other than a point source;

(43) "oils and grease" means oils and grease as defined by the procedure used under 18 AAC 70.020(c)(1);

(44) "persist" means the ability of a substance or chemical not to decay, degrade, transform, volatilize, hydrolyze, or photolyze;

(45) "pH" means the negative logarithm of the hydrogen-ion concentration, expressed as moles per liter: $pH = -\log_{10} (H^+)$;

(46) "point source" means a discernible, confined, and discrete conveyance, including a pipe, ditch, channel, tunnel, conduit, well, container, rolling stock, or vessel or other floating craft, from which pollutants are or could be discharged;

(47) "pollution" has the meaning given in AS 46.03.900;

(48) "practicable" means available and capable of being done after taking into consideration cost, existing technology, and logistics in light of overall project purposes;

(49) "residues" means floating solids, debris, sludge, deposits, foam, scum, or any other material or substance remaining in a waterbody as a result of direct or nearby human activity;

(50) "secondary recreation" means recreation activities in which water use is incidental, accidental, or sensory, including fishing, boating, camping, hunting, hiking, and vacationing;

(51) "sediment" means solid material of organic or mineral origin that is transported by, suspended in, or deposited from water; "sediment" includes chemical and bio-chemical precipitates and organic material, such as humus;

(52) "settleable solids" means solid material of organic or mineral origin that is transported by and deposited from water, as measured by the volumetric Imhoff cone method and at the method detection limits specified in method 2540(F), *Standard Methods for the Examination of Water and Wastewater*, 18th edition (1992);

ENVIRONMENTAL QUALITY BOARD

1615 Washington Street, East, Suite 301
Charleston, West Virginia 25311-2126

Telephone: (304) 558-4002
Fax: (304) 558-4116

Telephone: 1-800-480-4598
E-Mail: clerk@mail.wvnet.edu

MEMORANDUM

TO: **Board Members**
FROM: **Libby Chatfield**
DATE: **April 10, 2000**
RE: **Albright Power Station - selenium site-specific criterion**

As you know, Allegheny Power Company has been working with USEPA to develop site-specific provisions for selenium in response to EPAs disapproval of the 15.24 ug/l site-specific selenium value adopted in the Water Quality Standards in 1998.

The following two provisions outline the existing site-specific criteria in two tributaries of Daugherty Run, (striken-through language) and the language proposed to replace the existing language (underlined language)[1]. This proposed language has been reviewed and agreed to by representatives of Allegheny Power, Office of Water Resources of the WVDEP and USEPA, Region III.

~~7.2.d.8.1. Except that the following site-specific numeric criteria shall apply to the unnamed tributary of Daugherty Run approximately one mile upstream of Daughterty Run's confluence with the Cheat River: iron not to exceed 3.5 mg/l and selenium not to exceed 15.24 ug/l and the following site-specific numeric criteria shall apply to Fly Ash Run of Daugherty Run: aluminum: 888.5 ug/l and manganese: 5 mg/l.~~

7.2.d.8.1. Except that in the unnamed tributary of Daugherty Run, approximately one mile upstream of Daugherty Run's confluence with the Cheat River, a site specific numeric criterion for iron of 3.5 mg/l shall apply and the following frequency and duration requirements shall apply to the chronic numeric criterion for selenium (5ug/l): the four-day average concentration shall not be exceeded more than three times every three years (36 months), on average. Further, the following site-specific numeric criteria shall apply to Fly Ash Run of Daugherty Run: acute numeric criterion for aluminum: 888.5 ug/l and manganese: 5 mg/l.

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[1]Note: the proposed language amends the selenium provision and makes a minor change to the site-specific criterion for aluminum. The site-specific criteria for iron and manganese are not affected by this proposal.

Exhibit "G"

In this proposal, the statewide chronic numeric criterion for selenium, 5 ug/l, would be reinstated in the unnamed tributary of Daugherty Run. However, the frequency and duration requirements which apply to the chronic selenium criterion would be amended to allow 3 excursions of the criterion in a three year period as compared to the current allowance of 1 excursion every three years[2].

These alternate frequency and duration requirements were developed as part of a study prepared for Allegheny Power Company by the Great Lakes Environmental Center in Columbus, Ohio[3]. A risk assessment was conducted to determine whether the historical selenium discharges from the facility have caused impairment in the downstream aquatic community. The risk assessment included analyses of selenium concentrations in fish and macroinvertebrates collected in Daugherty Run. Comparisons were made between concentrations found in upstream and downstream populations as well as with the Daugherty Run data and national average background and safe concentrations of selenium.

According to the report, the results of the risk assessment for macroinvertebrates , which was based primarily on a comparison to the literature values[4], indicated that the residue concentrations measured in the downstream macroinvertebrates were found not to be at levels which are a risk to fish[5]. Results of the fish study indicated that selenium concentrations may be slightly elevated in brook trout downstream of the Unnamed Tributary[6], but the level in the

---

[2] Footnote 2 of Appendix E of the Water quality Standards establishes the following frequency and duration requirements for chronic numeric criteria: "Four-day average concentration not to be exceeded more than once every three years on the average, unless otherwise noted."

[3]The study is outlined in a report titled: Determination of the Site-Specific Average Frequency of allowed Excursions for Selenium for Outfall 003/004/005 at the Albright Power Station Ash Disposal Site, Albright, West Virginia, which has been distributed to you at a prior meeting.

[4]Report indicates that "because the number of replicate samples were reduced, the ability to make a conclusion regarding the statistical comparison of the selenium residues in the macroinvertebrates at the upstream and downstream stations was weakened. However, based on a comparison to literature values, the residue concentrations measured in the downstream macroinvertebrates were found not to be at levels which are a risk to fish."

[5]Selenium is known to bioaccumulate in the aquatic food chain, resulting in elevated concentrations in fish. Selenium may also cause dietary toxicity by in fish by uptake through the food chain.

[6]Average concentration of selenium in upstream samples (6 fish) = 2.77 ug/g, d.w.; average concentration of selenium in downstream samples (6 fish) = 3.23 ug/g d.w.. Report

downstream population is within the safe concentrations that are suggested in the literature. Based on these results, the report indicates that an the assumption can be made that the historic selenium discharges have not caused impairment to the downstream aquatic community.

The historic frequency of excursions of the selenium criterion of 5 ug/l in Daugherty Run was then examined to establish the average number of allowable excursions over a three year period. The investigators evaluated the historical data by dividing the number of excursions (6) by the number of years of data collected (prior to collection of macroinvertebrates and fish) (8), to arrive at an estimate of 0.75 excursions per year, or 2.25 excursions every 3 years. The report concludes that "These evaluations indicate that 2 to 3 excursions per three year period would not cause the downstream uses to be impaired."

The facility has requested adoption of the alternate frequency and duration provisions outlined in the report as an amendment to the Water Quality Standards rule. The proposed language above (underlined) reflects the request outlined in the report submitted by the facility. Representatives from Region III EPA and WVDEP have reviewed the language and support it's adoption.

Upon final adoption of this site-specific provision in the standards, the facility's NPDES permit will be amended to reflect this change and to include additional monitoring requirements. Selenium levels in fish tissue will be monitored every five years, consistent with the NPDES permitting cycle. In addition to that regular monitoring, the facility has agreed that if the 5 ug/l selenium is exceeded in Outfall 003/004/005 more than 2 times in a 3 year period, selenium concentrations will be measured in adult brook trout approximately 0.5 miles downstream of Unnamed Tributary. The goal of these monitoring requirements is to ensure that standards are being attained and that the alternate frequency and duration provisions do not negatively impact the aquatic life in the affected streams.

We will discuss the proposed language at the April 21st meeting. In addition to the Allegheny Power's report, you may want to review the letter from Mary Kuo, Office of Watersheds, USEPA, Region III, dated December 15, 1999, RE: Proposal for Site-Specific Selenium Criterion at Albright Station, which you should also have in your files.

If you have questions or comments, or need copies of the referenced documents, let me know.

---

states "these mean values are statistically different (t-test; $P < 0.05$)".

Allegheny Energy Supply
an Allegheny Energy company

Generation Division

800 Cabin Hill Drive
Greensburg, PA 15601-1689
(724) 837-3000

UPS OVERNITE

February 18, 2000

Libby Chatfield
Technical Advisor
Environmental Quality Board
1615 Washington Street East
Charleston, WV 25311-2126

Dear Ms. Chatfield:

Allegheny Energy Supply Company, LLC
Monongahela Power
Albright Power Station
NPDES Permit No. WV0075281
Proposed Permit Language for Se Site-Specific Criteria

In a December 15, 1999 letter to your office, the Environmental Protection Agency accepted our proposal for selenium site-specific criteria at our Albright CCB Landfill Facility. The proposal was to allow for a minor increase in the excursion frequency from once every three years on average to three times every three years on average, while maintaining the chronic selenium criterion of 5μg/l. We request the following changes be made in the existing NPDES permit (WV0075281).

The independent discharges 003, 004 and 005 currently have different effluent limits for arsenic, manganese, and aluminum, requiring that separate grab sampling continue for these outlets. We request that selenium be stricken as a requirement for Outlets 003, 004 and 005 in Section A, with subsequent creation of a flow weighted composite of grab samples collected from outlets 003, 004 and 005, known as 006. Outlet 006 would be collected once monthly and analyzed for selenium only. The effluent limit would be 5 μg /l with the allowable excursion frequency noted.

Furthermore, we request an addition to Section G. Other Requirements. as follows:

- The concentration of total selenium in Outlet 006, a flow weighted composite of grab samples collected from outlets 003, 004 and 005 shall not exceed 5 μg /l more than three times in any thirty-six month period. If the selenium concentration exceeds 5 μg /l more than three times over thirty-six months, the permittee may be required to conduct a study of the selenium residues in the tissues of fish and macroinvertebrates in Daugherty Run. The results of this study shall be submitted to WV DEP and EPA within one year of approval of the study plan. The site-specific selenium criteria shall apply to the Unnamed Tributary from the point of confluence of the three waste streams (003,004 and 005), downstream to its confluence with Daugherty Run.

Allegheny Energy Supply
an Allegheny Energy company
Generation Division

- The permittee shall prepare and submit to WV DEP and EPA for approval, within six months of permit reissuance, a study plan and time schedule for monitoring selenium concentrations in fish and macroinvertebrate whole body and tissue samples and sediment in Daugherty Run and the Unnamed Tributary. The study plan shall also include a proposal for assessing any teratogenic effects in larval and adult fish of Daugherty Run.

We appreciate the consideration of the Environmental Quality Board regarding this proposed permit language. If you have any questions, or wish to discuss the matter in further detail, please contact me on (724) 830-5544.

Sincerely,

Lisa L. Rundy-Peila
Environmental Specialist

Cc: John Britvec, WVDEP
Richard Herd, Allegheny Energy

UPS NEXT DAY AIR

Allegheny Energy Supply
an Allegheny Energy company

Generation Division

800 Cabin Hill Drive
Greensburg, PA 15601-1689
(724) 837-3000

March 13, 2000

Ms. Libby Chatfield
Technical Advisor
Environmental Quality Board
1615 Washington Street East
Charleston, WV 25311-2126

Dear Ms. Chatfield:

Allegheny Energy Supply Company, LLC
Monongahela Power
Albright Power Station
NPDES Permit No. WV0075281
Proposed Permit Language for Se Site-Specific Criteria

In a December 15, 1999 letter to your office, the Environmental Protection Agency accepted our proposal for selenium site-specific criteria at our Albright CCB Landfill Facility. The proposal was to allow for a minor increase in the excursion frequency from once every three years on average to three times every three years on average, while maintaining the chronic selenium criterion of 5µg/l. In order to implement this proposal, we request the following changes be made in the existing NPDES permit (WV0075281).

We request that Section A be changed to allow for replacement of the independent waste streams 003, 004 and 005 with a flow weighted composite of grab samples collected from the outlets 003, 004 and 005, known as 006. Outlet 006 would be sampled monthly and analyzed for all parameters currently monitored at the independent outlets. All effluent limits would remain unchanged from the current permit, with the allowable excursion frequency for selenium noted.

Furthermore, we request an addition to Section G. Other Requirements. as follows:

- The concentration of total selenium in Outlet 006, a flow weighted composite of grab samples collected from outlets 003, 004 and 005 shall not exceed 5 µg /l more than three times in any thirty-six month period. If the selenium concentration exceeds 5 µg /l more than three times over thirty-six months, the permittee may be required to conduct a study of the selenium residues in the tissues of fish and macroinvertebrates in Daugherty Run. The results of this study shall be submitted to WV DEP and EPA within one year of approval of the study plan. The site-specific selenium criteria shall apply to the Unnamed Tributary from the point of confluence of the three waste streams (003, 004 and 005), downstream to its confluence with Daugherty Run.

- The permittee shall prepare and submit to WV DEP and EPA for approval, within six months of permit reissuance, a study plan and time schedule for monitoring selenium concentrations in fish and macroinvertebrate whole body and tissue samples and sediment in Daugherty Run and the Unnamed Tributary. The study plan shall also include a proposal for assessing any teratogenic effects in larval and adult fish of Daugherty Run.

We appreciate the consideration of the Environmental Quality Board regarding this proposed permit language. If you have any questions, or wish to discuss the matter in further detail, please contact me on (724) 830-5544.

Sincerely,

Lisa L. Rundy-Peila

Lisa L. Rundy-Peila
Environmental Specialist

c: J. Britvec, WVDEP
R. H. Collins
R. S. Herd
M. Kuo - EPA Region III
J. P. Lapcevic