WEST VIRGINIA

SECRETARY OF STATE

KEN HECHLER

ADMINISTRATIVE LAW DIVISION

Form #3

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OFFICE OF WEST VIRGINIA
SECRETARY OF STATE

NOTICE OF AGENCY APPROVAL OF A PROPOSED RULE
AND
FILING WITH THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

AGENCY: Environmental Quality Board TITLE NUMBER: 46

CITE AUTHORITY 22B-3-4

AMENDMENT TO AN EXISTING RULE: YES X NO

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 1

TITLE OF RULE BEING AMENDED:

Requirements Governing Water Quality Standards

IF NO, SERIES NUMBER OF NEW RULE BEING PROPOSED:

TITLE OF RULE BEING PROPOSED:

THE ABOVE PROPOSED LEGISLATIVE RULE HAVING GONE TO A PUBLIC HEARING OR A PUBLIC COMMENT PERIOD IS HEREBY APPROVED BY THE PROMULGATING AGENCY FOR FILING WITH THE SECRETARY OF STATE AND THE LEGISLATIVE RULE MAKING REVIEW COMMITTEE FOR THEIR REVIEW.

Ann D Holstein

Authorized Signature

$15.40 w/o st comments
w/ comments
41.70

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Commissioner Letter

August 1, 1997

BUREAU OF ENVIRONMENT
10 McJunkin Road
Nitro, WV 25143-2506

CECIL H. UNDERWOOD
GOVERNOR

JOHN E. CAFFREY
COMMISSIONER

August 1, 1997

Ms. Judy Cooper
Director, Administrative Law Division
Office of the Secretary of State
Capitol Complex
Charleston, West Virginia 25305

RE: 46CSR1 - Requirements Governing Water Quality Standards

Dear Ms. Cooper:

This is to advise you that I am giving approval for filing with your office and Legislative Rulemaking notice of Agency Approval of the above-referenced rule.

Your cooperation in this regard is very much appreciated. If you have any questions or require additional information, please feel free to contact Libby Chatfield at 558-4002.

Sincerely yours,

John E. Caffrey
Commissioner

JEC:cc

Attachment

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

LRMRC Questionnaire

August 1, 1997

DATE: August 1, 1997

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM: Environmental Quality Board

LEGISLATIVE RULE TITLE: "Requirements Governing Water Quality Standards"

1. Authorizing statute(s) citation 22B-3-4

2. a. Date filed in State Register with Notice of Hearing

June 18, 1997

b. What other notice, including advertising, did you give of the hearing?

Published in Charleston Newspapers on June 25, 1997 and July 10, 1997

c. Date of Hearing(s) July 21, 1997 7:00 p.m.

d. Attach list of persons who appeared at hearing, comments received, amendments, reasons for amendments

Attached X No comments received

e. Date you filed in State Register the agency approved proposed Legislative Rule following public hearing: (be exact)

August 1, 1997

f. Name and **phone number(s)** of agency person(s) to contact for additional information:

Elizabeth Chatfield, Technical Advisor (304) 558-4002

3. If the statute under which you promulgated the submitted rules requires certain findings and determinations to be made as a condition precedent to their promulgation:

   a. Give the date upon which you filed in the State Register a notice of the time and place of a hearing for the taking of evidence and a general description of the issues to be decided.

      N/A

   b. Date of hearing: N/A

   c. On what date did you file in the State Register the findings and determinations required together with the reasons therefor?

      N/A

   d. Attach findings and determinations and reasons:

      Attached N/A

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Summary of Rule

August 1, 1997

46 CSR 1
Summary of Proposed Amendments

The following is a summary of revisions proposed by the Environmental Quality Board in the attached document:

- Deletions of and revisions to variances and site-specific numeric criteria in section 7.2.d of the rule.

- Addition of site-specific numeric criteria for aluminum, iron, manganese and selenium in two tributaries of the Cheat River. Note: information sheets on these proposed site-specific revisions as well as supporting documentation of the requested criteria may be obtained from the Board office by calling the number provided below.

- Deletion of the body burden criteria in sections 8.22.1 and 8.22.2 and adoption of alternate methods of determining background concentrations for parameters for which the water quality criteria are lower than the detection limit (see section 8.5). Please note that the new provisions proposed in section 8.5 were recommended by an inter-agency committee assigned by the Board to review the body burden criteria. For more information about the committee's recommendations, please contact the Board Office at the number provided below.

- Revisions to section 7.2.c.D, which allows an exception from the application of numeric criteria in waters "where lesser quality is due to natural conditions" and provides that "In such cases the naturally occurring values shall be the applicable criteria."

- Removal of category B3, "small, nonfishable streams" from section 6.3.

- Removal of the chronic value for aluminum in section 8.1

- Removal of section 8.15.1 associated with the iron criteria

- Removal of the chronic aquatic life values for manganese in section 8.17 and deletion of section 8.17.1

- Revision of section 8.19 - chronic nickel criteria for trout waters

- Revision of section 8.22 - chronic criteria for aldrin, chloroform and tetrachloroethane

- Revision of the numeric criteria for phenols in section 8.24

- Removal of human health criteria for total residual chlorine in section 8.31

- Removal human health criterion for zinc in section 8.33

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Statement of Circumstances

August 1, 1997

46 CSR 1

Statement of Circumstances Requiring Amendments

The Environmental Quality Board is required by the federal Clean Water Act to review the Water Quality Standards legislative rule, 46 CSR 1,"Requirements Governing Water Quality Standards" every three years. The Board provided notice in January that the triennial review was ongoing and solicited comments from interested parties regarding changes to the rule. The amendments proposed herein are based on recommendations from the US Environmental Protection Agency (USEPA) as well as suggestions from interested parties.

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Fiscal Note

August 1, 1997

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: Title 46, Series 1 "Requirements Governing Water Quality Standards"

Type of Rule: X **Legislative** **Interpretive** **Procedural**

Agency Environmental Quality Board

Address 1615 Washington Street, East

Charleston, WV 25311-2126

1. **Effect of Proposed Rule** N/A

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

2. **Explanation of above estimates:** N/A

3. **Objectives of these rules:** To bring this rule into compliance with federal requirements and to address suggestions made by interested parties.

Rule Title: "Requirements Governing Water Quality Standards"

4. Explanation of Overall Economic Impact of Proposed Rule.

A. Economic Impact on State Government.

None anticipated

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

The amendments may affect requirements in National Pollution Discharge Elimination System (NPDES) permits and may have an economic impact on holders of those permits.

C. Economic Impact on Citizens/Public at Large.

None anticipated

Date: August 1, 1997

Signature of Agency Head or Authorized Representative

Ann Holstein

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Agency Approved Rule

August 1, 1997

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SECRETARY OF STATE

TITLE 46
LEGISLATIVE RULES
ENVIRONMENTAL QUALITY BOARD

SERIES 1
REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

§46-1-1. General.

1.1. Scope. -- These rules establish requirements governing the discharge or deposit of sewage, industrial wastes and other wastes into the waters of the State and establish water quality standards for the waters of the State standing or flowing over the surface of the State. It is declared to be the public policy of the State of West Virginia to maintain reasonable standards of purity and quality of the water of the State consistent with (1) public health and public enjoyment thereof; (2) the propagation and protection of animal, bird, fish, and other aquatic and plant life; and (3) the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development. (See W. Va. Code § 22-11-2.)

1.2. Authority. -- W. Va. Code §22B-3-4

1.3. Filing Date. -- ~~April 30, 1996~~

1.4. Effective Date. -- ~~May 6, 1996~~

§46-1-2. Definitions.

The following definitions in addition to those set forth in W. Va. Code §22-11-3, shall apply to these rules unless otherwise specified herein, or unless the context in which used clearly requires a different meaning:

2.1. "Board" is the Environmental Quality Board.

2.2. "Chief" is the Chief of the Office of Water Resources of the West Virginia Division of Environmental Protection.

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

2.4. "Cumulative" means a pollutant which increases in concentration in an organism by successive additions at different times or in different ways (bio-accumulation).

2.5. "Designated uses" are those uses specified in water quality standards for each water body or segment whether or not they are being attained. (See section 6.2.)

2.6. "Existing uses" are those uses actually attained in a water body on or after November 28, 1975, whether or not they are included in the water quality standards.

2.7. The "Federal Act" means the Clean Water Act (also known as the Federal Water Pollution Control Act) Public Law 92-500, as amended by Public Law 100-4, 33 U.S.C. 1251, et seq.

2.8. "High quality waters" are those waters whose quality is equal to or better than the minimum levels necessary to achieve the national water quality goal uses.

2.9. "Intermittent streams" are streams which have no flow during sustained periods of no precipitation and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six (6) months.

2.10. "Outstanding national resource waters" are those whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or State resource.

2.11. "Natural" or "naturally occurring" values or "natural temperature" shall mean for all of the waters of the State:

2.11.a. Those water quality values which exist unaffected by -- or unaffected as a consequence of -- any water use by any person; and

2.11.b. Those water quality values which exist unaffected by the discharge, or direct or indirect deposit of, any solid, liquid or gaseous substance ~~by any person~~ from any point source or non-point source.

2.12. "Non-point source" shall mean any source other than a point source from which pollutants may reach the waters of the State.

2.13. "Persistent" shall mean a pollutant and its transformation products which under natural conditions degrade slowly in an aquatic environment.

2.14. "Point source" shall mean any discernible, confined and discrete conveyance, including, but not limited to, any pipe, ditch, channel, tunnel, conduit, well, discrete fissure, container, rolling stock or vessel or other floating craft, from which pollutants are or may be

discharged. This term does not include agricultural stormwater discharges and return flows from irrigated agriculture.

2.15. "Representative important species of aquatic life" shall mean those species of aquatic life whose protection and propagation will assure the sustained presence of a balanced aquatic community. Such species are representative in the sense that maintenance of water quality criteria will assure both the natural completion of the species' life cycles and the overall protection and sustained propagation of the balanced aquatic community.

2.16. The "State Act" or "State Law" shall mean the West Virginia Water Pollution Control Act, W. Va. Code §22-11-1.

2.17. "Total recoverable" refers to the digestion procedure for certain heavy metals as referenced in 40 CFR 136, as amended June 15, 1990, Guidelines Establishing Test Procedures for the Analysis of Pollutants Under the Clean Water Act.

2.18. "Trout waters" are streams or stream segments which sustain year-round trout populations. Excluded are those streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.

2.19. "Water quality criteria" shall mean levels of parameters or stream conditions that are required to be maintained by these regulations. Criteria may be expressed as a constituent concentration, levels, or narrative statement, representing a quality of water that supports a designated use or uses.

2.20. "Water quality standards" means the combination of water uses to be protected and the water quality criteria to be maintained by these rules.

2.21. "Wetlands" are those areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs and similar areas.

2.22. "Wet weather streams" are streams that flow only in direct response to precipitation or whose channels are at all times above the water table.

§46-1-3. Conditions Not Allowable In State Waters.

3.1. Certain characteristics of sewage, industrial wastes and other wastes cause pollution and are objectionable in all waters of the State. Therefore, the Environmental Quality Board does hereby proclaim that the following general conditions are not to be allowed in any of the waters of the State.

3.2. No sewage, industrial wastes or other wastes present in any of the waters of the State shall cause therein or materially contribute to any of the following conditions thereof:

3.2.a. Distinctly visible floating or settleable solids, suspended solids, scum, foam or oily slicks;

3.2.b. Deposits or sludge banks on the bottom;

3.2.c. Odors in the vicinity of the waters;

3.2.d. Taste or odor that would adversely affect the designated uses of the affected waters;

3.2.e. Materials in concentrations which are harmful, hazardous or toxic to man, animal or aquatic life;

3.2.f. Distinctly visible color;

3.2.g. Concentrations of bacteria which may impair or interfere with the designated uses of the affected waters;

3.2.h. Requiring an unreasonable degree of treatment for the production of potable water by modern water treatment processes as commonly employed; and

3.2.i. Any other condition, including radiological exposure, which adversely alters the integrity of the waters of the State including wetlands; no significant adverse impact to the chemical, physical, hydrologic, or biological components of aquatic ecosystems shall be allowed.

§46-1-4. Anti-Degradation Policy.

4.1. It is the policy of the State of West Virginia the waters of the state shall be maintained and protected as follows:

4.1.a. Existing water uses and the level of water quality necessary to protect the existing uses shall be maintained and protected. Existing uses are those uses actually attained in the water body on or after November 28, 1975, whether or not they are included as designated uses within these water quality standards.

4.1.b. The existing high quality waters of the State must be maintained at their existing high quality unless it is determined after satisfaction of the intergovernmental coordination of the State's continuing planning process and opportunity for public comment and hearing that allowing lower water quality is necessary to accommodate important economic or

social development in the area in which the waters are located. If limited degradation is allowed, it shall not result in injury or interference with existing stream water uses or in violation of State or Federal water quality criteria that describe the base levels necessary to sustain the national water quality goal uses of protection and propagation of fish, shellfish and wildlife and recreating in and on the water.

In addition, the Board and the chief shall assure that all new and existing point sources shall achieve the highest established statutory and regulatory requirements applicable to them and shall assure the achievement of cost-effective and reasonable best management practices for non-point source control.

4.1.b.1. High quality waters are those waters meeting the definition at section ~~2.6~~ 2.8 herein.

4.1.b.2. High quality waters include but are not limited to the following:

4.1.b.2.A. Streams designated by the West Virginia Legislature under the West Virginia Natural Stream Preservation Act, pursuant to W. Va. Code Section 22-13-5; and

4.1.b.2.B. Streams listed in West Virginia High Quality Streams, Fifth Edition, prepared by the Wildlife Resources Division, Department of Natural Resources (1986).

4.1.b.2.C. Streams or stream segments which receive annual stockings of trout but which do not support year-round trout populations.

4.1.c. In waters which constitute a water of special concern no activities which result in the reduction of ambient water quality shall be allowed. Waters of special concern include:

4.1.c.1. All Federally designated rivers under the "Wild and Scenic Rivers Act" Public Law 95-542 as amended, 16 U.S.C. 1271, et seq .

4.1.c.2. All naturally reproducing trout streams.

4.1.c.3. All streams and other bodies of water in State and National Forests and Recreation Areas.

4.1.c.4. National Rivers. "National Parks and Recreation Act of 1978." Public Law 95-625, as amended, 16 U.S.C.1, et seq.

4.1.d. In all cases, waters which constitute an outstanding national resource shall

be maintained and protected and improved where necessary. Outstanding national resource waters include, but are not limited to, all streams and rivers within the boundaries of Wilderness Areas designated by The Wilderness Act (16 U.S.C. 1131 et seq.) within the State.

Additional waters may be nominated for inclusion in that category by any interested party or by the Board on its own initiative. To designate a nominated water as an outstanding national resource water, the Board shall follow the public notice and hearing provisions as provided in 46 C.S.R. 6.

4.1.e. All applicable requirements of Section 316 (a) of the Federal Act shall apply to modifications of the temperature water quality criteria provided for in these rules.

§46-1-5. Mixing Zones.

5.1. In the permit review and planning process or upon the request of a permit applicant or permittee, the chief may establish on a case-by-case basis an appropriate mixing zone.

5.2. The following guidelines and conditions are applicable to all mixing zones:

5.2.a. The chief will assign, on a case-by-case basis, definable geometric limits for mixing zones for a discharge or a pollutant or pollutants within a discharge. Applicable limits shall include, but may not be limited to, the linear distances from the point of discharge, surface area involvement, volume of receiving water, and shall take into account other nearby mixing zones. Mixing zones shall take into account the mixing conditions in the receiving stream (i.e: whether complete or incomplete mixing conditions exist). Mixing zones will not be allowed until applicable limits are assigned by the chief in accordance with this section.

5.2.b. Concentrations of pollutants which exceed the acute criteria for protection of aquatic life set forth in Appendix E shall not exist at any point within an assigned mixing zone or in the discharge itself unless a zone of initial dilution is assigned. A zone of initial dilution may be assigned on a case-by-case basis at the discretion of the chief. The zone of initial dilution is the area within the mixing zone where initial dilution of the effluent with the receiving water occurs, and where the concentration of the effluent will be its greatest in the water column. Where a zone of initial dilution is assigned by the Chief, the size of the zone shall be determined using one of the four alternatives outlined in Section 4.3.3 of EPAs Technical Support Document for Water Quality-based Toxics Control (EPA/505/2-90-001 PB91-127415, March 1991). Concentrations of pollutants shall not exceed the acute criteria at the edge of the assigned zone of initial dilution. Chronic criteria for the protection of aquatic life may be exceeded within the mixing zone but shall be met at the edge of the assigned mixing zone.

5.2.c. Concentrations of pollutants which exceed the criteria for the protection of human health set forth in Appendix E shall not be allowed at any point unless a mixing zone has been assigned by the Chief after consultation with the Commissioner of the West Virginia Bureau of Public Health. Human health criteria may be exceeded within an assigned mixing

zone, but shall be met at the edge of the assigned mixing zone. Mixing zones for human health criteria shall be sized to prevent significant human health risks and shall be developed using reasonable assumptions about exposure pathways. In assessing the potential human health risks of establishing a mixing zone upstream from a drinking water intake, the Chief shall consider the cumulative effects of multiple discharges and mixing zones on the drinking water intake. No mixing zone for human health criteria shall be established on a stream which has a seven (7) day, ten (10) year return frequency of 5 cfs or less.

5.2.d. Mixing zones, including zones of initial dilution, shall not interfere with fish spawning or nursery areas or fish migration routes; shall not overlap public water supply intakes or bathing areas; cause lethality to or preclude the free passage of fish or other aquatic life; nor harm any threatened or endangered species, as listed in the Federal Endangered Species Act.

5.2.e. The mixing zone shall not exceed one-third (1/3) of the width of the receiving stream, and in no case shall the mixing zone exceed one-half (½) of the cross-sectional area of the receiving stream.

5.2.f. In lakes and other surface impoundments, the volume of a mixing zone shall not affect in excess of ten (10) percent of the volume of that portion of the receiving waters available for mixing.

5.2.g. A mixing zone shall be limited to an area or volume which will not adversely alter the existing or designated uses of the receiving water, nor be so large as to adversely affect the integrity of the water body.

5.2.h. Mixing zones shall not:

5.2.h.1. Be used for, or considered as, a substitute for technology-based requirements of the Clean Water Act and other applicable State and Federal laws.

5.2.h.2. Extend downstream at any time a distance more than five times the width of the receiving watercourse at the point of discharge.

5.2.h.3. Cause or contribute to any of the conditions prohibited in Section 46-1-3.

5.2.h.4. Be granted where instream waste concentration of a discharge is greater than 80%.

5.2.h.5. Overlap one another.

5.2.h.6. Overlap any ½ mile zone described in section 7.2.a.2 herein.

5.2.i. In the case of thermal discharges, a successful demonstration conducted under Section 316(a) of the Clean Water Act shall constitute compliance with all provisions of this section.

5.2.j. The Chief may waive the requirements of subsections (e) and (h)(B) above if a discharger provides an acceptable demonstration of:

5.2.j.1. Information defining the actual boundaries of the mixing zone in question; and

5.2.j.2. Information and data proving no violation of subsection (d) and (g) above by the mixing zone in question.

5.2.k. Upon implementation of a mixing zone in a permit, the permittee shall provide documentation that demonstrates to the satisfaction of the Chief that the mixing zone is in compliance with the provisions outlined in subsections (b),(c),(e) and (h)(B).

5.2.l. In order to facilitate a determination or assessment of a mixing zone pursuant to this section, the chief may require a permit applicant or permittee to submit such information as deemed necessary.

§46-1-6. Water Use Categories.

6.1. These rules establish general Water Use Categories and Water Quality Standards for the waters of the State. Unless otherwise designated by these rules, at a minimum all waters of the State are designated for the Propagation and maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C) consistent with Clean Water Act goals. Incidental utilization for whatever purpose may or may not constitute a justification for assignment of a water use category to a particular stream segment.

6.1.a. Waste assimilation and transport are not recognized as designated uses. The classification of the waters must take into consideration the use and value of water for public water supplies, protection and propagation of fish, shellfish and wildlife, recreation in and on the water, agricultural, industrial and other purposes including navigation.

Subcategories of a use may be adopted and appropriate criteria set to reflect varying needs of such subcategories of uses, for example to differentiate between trout water and other waters.

6.1.b. At a minimum, uses are deemed attainable if they can be achieved by the imposition of effluent limits required under Sections 301 (b) and 306 of the Federal Clean Water Act and use of cost-effective and reasonable best management practices for non-point

source control. Seasonal uses may be adopted as an alternative to reclassifying a water body or segment thereof to uses requiring less stringent water quality criteria. If seasonal uses are adopted, water quality criteria will be adjusted to reflect the seasonal uses; however, such criteria shall not preclude the attainment and maintenance of a more protective use in another season. A designated use which is not an existing use may be removed, or subcategories of a use may be established if it can be demonstrated that attaining the designated use is not feasible because:

6.1.b.1. Application of effluent limitations for existing sources more stringent than those required pursuant to Section 301 (b) and Section 306 of the Federal Act in order to attain the existing designated use would result in substantial and widespread adverse economic and social impact; or

6.1.b.2. Naturally-occurring pollutant concentrations prevent the attainment of the use; or

6.1.b.3. Natural, ephemeral, intermittent or low flow conditions of water levels prevent the attainment of the use, unless these conditions may be compensated for by the discharge of sufficient volume of effluent discharges to enable uses to be met; or

6.1.b.4. Human-caused conditions or sources of pollution prevent the attainment of the use and cannot be remedied or would cause more environmental damage to correct than to leave in place; or

6.1.b.5. Dams, diversions or other types of hydrologic modifications preclude the attainment of the use, and it is not feasible to restore the water body to its original condition or to operate such modification in a way that would result in the attainment of the use; or

6.1.b.6. Physical conditions related to the natural features of the water body, such as the lack of a proper substrate, cover, flow, depth, pools, riffles, and the like, unrelated to water quality, preclude attainment of aquatic life protection uses.

6.1.c. The State shall take into consideration the quality of downstream waters and shall assure that its water quality standards provide for the attainment of the water quality standards of downstream waters.

6.1.d. In establishing a less restrictive use or uses, or subcategory of use or uses, and the water quality criteria based upon such uses, the Board shall follow the requirements for revision of water quality standards as required by W. Va. Code §22B-3-4 and Section 303 of the Federal Act and the regulations thereunder. Any revision of water quality standards shall be made with the concurrence of EPA. The Board's administrative procedural regulations for applying for less restrictive uses or criteria shall be followed.

6.2. Category A -- Water Supply, Public. -- This category is used to describe waters which, after conventional treatment, are used for human consumption. This category includes streams on which the following are located:

6.2.a. All community domestic water supply systems;

6.2.b. All non-community domestic water supply systems, (i.e. hospitals, schools, etc.);

6.2.c. All private domestic water systems;

6.2.d. All other surface water intakes where the water is used for human consumption. (See Appendix B for partial listing of category A waters; see section 7.2.a.B. for additional requirements for category A waters.)

6.3. Category B -- Propagation and maintenance of fish and other aquatic life. -- This category includes:

6.3.a. Category B1 -- Warm water fishery streams. -- Streams or stream segments which contain ~~a fish~~ populations composed ~~overwhelmingly of warm water species~~ of all warm water aquatic life. ~~(These are primarily sport fisheries and may be stocked with trout seasonally.)~~

6.3.b. Category B2 -- Trout Waters. -- As defined in Section ~~2.16~~ 2.18 (See Appendix A for a representative list.)

~~6.3.c. Category B3 -- Small non-fishable streams. -- Streams or stream segments which because of their size or flow patterns do not offer sport fishing; they generally contain populations of minnows, darters, aquatic invertebrates, etc.~~

6.3.c. Category B4 -- Wetlands. -- As defined in section ~~2.19~~ 2.21; certain numeric stream criteria may not be appropriate for application to wetlands (see Appendix E).

6.4. Category C -- Water contact recreation. -- This category includes swimming, fishing, water skiing and certain types of pleasure boating such as sailing in very small craft and outboard motor boats. See Appendix D for a representative list of category C waters.

6.5. Category D. -- Agriculture and wildlife uses.

6.5.a. Category D1 -- Irrigation. -- This category includes all stream segments used for irrigation.

6.5.b. Category D2 -- Livestock watering. -- This category includes all stream

segments used for livestock watering.

6.5.c. Category D3 -- Wildlife. -- This category includes all stream segments and wetlands used by wildlife.

6.6. Category E -- Water supply industrial, water transport, cooling and power. -- This category includes cooling water, industrial water supply, power production, commercial and pleasure vessel activity, except those small craft included in Category C.

6.6.a. Category E1 -- Water Transport. -- This category includes all stream segments modified for water transport and having permanently maintained navigation aides.

6.6.b. Category E2 -- Cooling Water. -- This category includes all stream segments having one (1) or more users for industrial cooling.

6.6.c. Category E3 -- Power production. -- This category includes all stream segments extending from a point 500 feet upstream from the intake to a point one half (½) mile below the wastewater discharge point. (See Appendix C for representative list.)

6.6.d. Category E4 -- Industrial. -- This category is used to describe all stream segments with one (1) or more industrial users. It does not include water for cooling.

§46-1-7. West Virginia Waters.

7.1. Major River Basins and their Alphanumeric System. All streams and their tributaries in West Virginia shall be individually identified using an alphanumeric system as identified in the "Key to West Virginia Stream Systems and Major Tributaries" (1956) as published by the Conservation Commission of West Virginia and revised by the West Virginia Department of Natural Resources, Division of Wildlife (1985).

7.1.a. J - James River Basin. All tributaries to the West Virginia - Virginia State line.

7.1.b. P - Potomac River Basin. All tributaries of the main stem of the Potomac River to the West Virginia - Maryland - Virginia State line to the confluence of the North Branch and the South Branch of the Potomac River and all tributaries arising in West Virginia excluding the major tributaries hereinafter designated:

7.1.b.1. S - Shenandoah River and all its tributaries arising in West Virginia to the West Virginia - Virginia State line.

7.1.b.2. PC - Cacapon River and all its tributaries.

7.1.b.3. PSB - South Branch and all its tributaries.

7.1.b.4. PNB - North Branch and all tributaries to the North Branch arising in West Virginia.

7.1.c. M - Monongahela River Basin. The Monongahela River Basin main stem and all its tributaries excluding the following major tributaries which are designated as follows:

7.1.c.1. MC - Cheat River and all its tributaries except those listed below:

6.1.c.1.A. MCB - Blackwater River and all its tributaries.

7.1.c.2. MW - West Fork River and all its tributaries.

7.1.c.3. MT - Tygart River and all its tributaries except those listed below:

7.1.c.3.A. MTB - Buckhannon River and all its tributaries.

7.1.c.3.B. MTM - Middle Fork River and all its tributaries.

7.1.c.4. MY - Youghigheny River and all its tributaries to the West Virginia - Maryland State line.

7.1.d. O Zone 1 - Ohio River - Main Stem. The main stem of the Ohio River from the Ohio - Pennsylvania - West Virginia State line to the Ohio - Kentucky - West Virginia State line.

7.1.e. O Zone 2 - Ohio River - Tributaries. All tributaries of the Ohio River excluding the following major tributaries:

7.1.e.1. LK - Little Kanawha River. The Little Kanawha River and all its tributaries excluding the following major tributary which is designated as follows:

7.1.e.1.A. LKH - Hughes River and all its tributaries.

7.1.e.2. K - Kanawha River Zone 1. The main stem of the Kanawha River from mile point 0, at its confluence with the Ohio River, to mile point 72 near Diamond, West Virginia.

7.1.e.3. K - Kanawha River Zone 2. The main stem of the Kanawha River from mile point 72 near Diamond, West Virginia and all its tributaries from mile point 0 to the headwaters excluding the following major tributaries which are designated as follows:

7.1.e.3.A. KP - Pocatalico River and all its tributaries.

7.1.e.3.B. KC - Coal River and all its tributaries.

7.1.e.3.C. KE - Elk River and all its tributaries.

7.1.e.3.D. KG - Gauley River. The Gauley River and all its tributaries excluding the following major tributaries which are designated as follows:

7.1.e.3.D.1. KG-19 - Meadow River and all its tributaries.

7.1.e.3.D.2. KG-34 - Cherry River and all its tributaries.

7.1.e.3.D.3. KGC - Cranberry River and all its tributaries.

7.1.e.3.D.4. KGW - Williams River and all its tributaries.

7.1.e.3.E. KN - New River. The New River from its confluence with the Gauley River to the Virginia - West Virginia State line and all tributaries excluding the following major tributaries which are designated as follows:

7.1.e.3.E.1. KNG - Greenbrier River and all its tributaries.

7.1.e.3.E.2. KNB - Bluestone River and all its tributaries.

7.1.e.3.E.3. KN-60 - East River and all its tributaries.

7.1.e.3.E.4. K(L)-81-(1) - Bluestone Lake.

7.1.e.4. OG - Guyandotte River. The Guyandotte River and all its tributaries excluding the following major tributary which is designated as follows:

7.1.e.4.1. OGM - Mud River and all its tributaries.

7.1.e.5. BS - Big Sandy River. The Big Sandy River to the Kentucky - Virginia - West Virginia State lines and all its tributaries arising in West Virginia excluding the following major tributary which is designated as follows:

7.1.e.5.1 BST - Tug Fork and all its tributaries.

7.2. Applicability of Water Quality Standards. The following shall apply at all times unless a specific exception is granted in this section:

7.2.a. Water Use Categories as described in Section 6.

7.2.a.1. Based on meeting those Section 6 definitions, tributaries or stream segments may be classified for one or more Water Use Categories. When more than one use exists, they shall be protected by criteria for the use category requiring the most stringent protection.

7.2.a.2. Each segment extending upstream from the intake of a water supply public (Water Use Category A), for a distance of one half (½) mile or to the headwater, must be protected by prohibiting the discharge of any pollutants in excess of the concentrations designated for this Water Use Category in Section 8. In addition, within that one half (½) mile zone, the Chief may establish for any discharge, effluent limitations for the protection of human health that require additional removal of pollutants than would otherwise be provided by this rule. (If a watershed is not significantly larger than this zone above the intake, the water supply section may include the entire upstream watershed to its headwaters.

7.2.b. In the absence of any special application or contrary provision, numeric water quality standards shall apply at all times when flows are equal to or greater than the minimum mean seven (7) consecutive day drought flow with a ten (10) year return frequency (7Q10). NOTE: Exceptions do not apply to trout waters nor the requirements of Section 3.

7.2.c. Exceptions: Numeric water quality standards shall not apply: (See section 7.2.d for site specific revisions)

7.2.c.1. When the flow is less than 7Q10;

7.2.c.2. In wet weather streams (or intermittent streams, when they are dry or have no measurable flow): Provided, That the existing and designated uses of downstream waters are not adversely affected;

7.2.c.3. In any assigned zone of initial dilution of any mixing zone where a zone of initial dilution is required by section 5.2.b herein, or in any assigned mixing zone for human health criteria or aquatic life criteria for which a zone of initial dilution is not assigned; In zones of initial dilution and certain mixing zones: Provided, That all requirements described in §5 herein shall apply to all zones of initial dilution and all mixing zones;

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.

7.2.d. Site-specific applicability of water use categories and water quality criteria - State-wide water quality standards shall apply except where site-specific numeric criteria, variances or use removals have been approved following application and hearing, as provided in

46 C.S.R. 6. (See §8.3 and §8.4) The following are approved site-specific criteria, variances and use removals:

7.2.d.1. James River - (Reserved)

7.2.d.2. Potomac River

~~7.2.d.2.A. Except for the unnamed tributary of the South Branch of Buzzard Run above and below Prather Pond shall not have Water Use Category A; therefore may contain fluoride not to exceed 2.0 mg/1.~~

7.2.d.2.1. Except that a site-specific numeric criterion for aluminum, not to exceed 500 ug/l, shall apply to the section of Opequon Creek from Turkey Run to the Potomac River.

7.2.d.3.. Shenandoah River - (Reserved)

7.2.d.4.. Cacapon River - (Reserved)

7.2.d.5. South Branch - (Reserved)

7.2.d.6. North Branch

7.2.d.6.1 Except that the Stony River downstream from the limit of the thermal mixing zone (as established by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to its confluence with the North Branch of the Potomac River is exempt from the 5°F above natural temperature rise; however, the maximum temperature outside the mixing zone shall not exceed 87°F at any time during the months of May through November and not exceed 73°F at any time during the months of December through April. <u>This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Clean Water Act or December 31, 1998, whichever comes first.</u>

7.2.d.7. Monongahela River

7.2.d.7.1. Except that flow in the main stem of the Monongahela River, as regulated by the Tygart Reservoir, operated by the U. S. Army Corps of Engineers, is based on a minimum flow of 345 cfs at Lock and Dam No. 8, river mile point 90.8. This exception does not apply to tributaries of the Monongahela River.

~~7.2.d.7.2. Except that site-specific numeric criteria shall apply to an unnamed tributary to the Monongahela River mainstem at approximately 3700 feet upstream of mile point 125, which may contain suspended solids not to exceed 60 mg/1, oil and grease not~~

~~to exceed 15 mg/1, Ammonia Nitrogen not to exceed 30 mg/1, total phenols not to exceed .10 mg/1, total cyanide not to exceed .05 mg/1, total manganese not to exceed 4 mg/1, total zinc not to exceed 1.5 mg/1, total copper not to exceed 1.0 mg/1, Benzene not to exceed .05 mg/1, Napthalene not to exceed .05 mg/1 and Benzo (a) Pyrene not to exceed .05 mg/1 and iron not to exceed 4 mg/1 for the months June through November and 7 mg/1 for the months of December through May.~~

7.2.d.8. Cheat River - ~~(Reserved)~~ 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.9. Blackwater River - (Reserved)

7.2.d.10. West Fork River - (Reserved)

7.2.d.11. Tygart River - (Reserved)

7.2.d.12. Buckhannon River - (Reserved)

7.2.d.13. Middle Fork River - (Reserved)

7.2.d.14. Youghiogheny River

7.2.d.14.1 Water Use Categories A and E are excluded from the tributaries of the Youghiogheny River in West Virginia which flow into Maryland.

7.2.d.15. Ohio River Main Stem - (Reserved)

7.2.d.16. Ohio River Tributaries.

7.2.d.16.1. Except that site-specific numeric criteria shall apply to the stretch of Conners Run (0-77-A), a tributary of Fish Creek, from its mouth to the discharge from Conner Run impoundment, which shall not have the Water Use Category A and may contain ~~arsenic not to exceed 200 ug/1;~~ selenium not to exceed 62 ug/1; and iron not to exceed 3.5 mg/1 as a monthly average and 7 mg/1 as a daily maximum.

7.2.d.16.2. ~~Except that site-specific numeric criteria shall apply to that segment of Harmon Creek (0-97) from its confluence with the Ohio River to a point 2.2 miles upstream, which shall not have the Water Use Category A designation. Therefore, at any time the temperature shall not exceed 100°F, total iron shall not exceed 4.0 mg/1 and total~~

~~fluoride shall not exceed 2.0 mg/l, each as thirty (30) day average values to be determined from four (4) weekly samples.~~ Except that a socio-economic variance shall apply to that segment of Harmon Creek (0-97) from its confluence with the Ohio River to a point 2.2 miles upstream, which shall not have water use Category A designation, and which shall have the following instream criteria: Free Cyanide 70 ug/l, Daily Maximum; Lead 14 ug/l, Daily Maximum, Total Phenolic Materials 10 ug/l, Daily Maximum, Zinc 200 ug/l, Daily Maximum, Temperature 100° F (monitored per Footnote 12 of the permit); Iron 4.0 mg/l, Monthly Average and 8.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit); Fluoride 2.0 mg/l, Monthly Average and 4.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit). Provided, however, that the criteria for Free Cyanide, Lead, Total Phenolic Materials, Zinc, Temperature and Iron shall not apply, and instead the state-wide criteria for these parameters shall apply, unless: Weirton Steel Corporation (1) submits to the Office of Water Resources on or before May 30, 1999 a report setting forth the water quality of the discharge from Outlet 004 for these parameters during the period from June 1, 1998 to May 1, 1999; (2) offers proposals for any appropriate reductions in the above excepted levels; (3) provides an engineering analysis of potential alternatives for reducing further the concentrations of said parameters in the discharge toward achieving statewide criteria; and (4) submits to the Office of Water Resources on a semi-annual basis commencing on December 31, 1997, summary reports on the water quality of the discharge from Outlet 004 and the efforts made by Weirton Steel Corporation during the prior six (6) months to improve the quality of said discharge. These exceptions shall be in effect until action by the Environmental Quality Board to revise such exceptions or until June 29, 2000, or whichever comes first.

~~7.2.d.16.3. Except in the stretch of Cow Creek (0-55) from its mouth to a point approximately 2,300 feet upstream, the Water Use Category A shall not apply.~~

7.2.d.17. Little Kanawha River. - (Reserved)

7.2.d.18. Hughes River - (Reserved)

7.2.d.19. Kanawha River Zone 1 - Main Stem

7.2.d.19.1 For the Kanawha River main stem, Zone 1, Water Use Category A shall not apply; and

7.2.d.19.2. The minimum flow shall be 1,960 cfs at the Charleston gauge.

7.2.d.20. Kanawha River Zone 2 and Tributaries.

7.2.d.20.1. For the main stem of the Kanawha River only, the minimum flow shall be 1,896 cfs at mile point 72.

7.2.d.20.2. Except the stretch between the mouth of Little Scary Creek (K-31) and the Little Scary impoundment shall not have Water Use Category A ~~or B1 and shall have Water Use Category B3~~. The following site-specific numeric criterion shall apply to that section: ~~arsenic not to exceed 200 ug/1 and~~ selenium not to exceed 62 ug/1; and copper not to exceed 105 ug/1 as a daily maximum nor 49 ug/1 as a 4-day average.

~~7.2.d.20.3. Except for Ward Hollow (K-39-A), a small tributary of Davis Creek which may contain chlorides not to exceed 540 mg/1.~~

7.2.d.20.3. Except for Simmons Creek (K-54) from its mouth to a point 1200 feet upstream to which the following site-specific numeric criterion shall apply: a maximum daily temperature not to exceed 38°C (100°F) nor a monthly average temperature to exceed 34°C. This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Clean Water Act or May 30, 1998, whichever comes first.

7.2.d.21. Pocatalico River - (Reserved)

7.2.d.22. Coal River - (Reserved)

7.2.d.23. Elk River - (Reserved)

7.2.d.24. Gauley River - (Reserved)

7.2.d.25. Meadow River - (Reserved)

7.2.d.26. Cherry River - (Reserved)

7.2.d.27. Cranberry River - (Reserved)

7.2.d.28. Williams River - (Reserved)

7.2.d.29. New River - (Reserved)

~~7.2.d.29.1. Except the stretch of Laurel Creek (KN-5), a tributary of the New River, from the confluence of Dempsey Branch and Laurel Creek to a point 1.7 miles below, where the site-specific numeric criterion for iron shall be 2.0 mg/1 total iron, and from that point to the confluence of Laurel Creek and the New River, the site-specific numeric criterion for iron shall be 1.0 mg/1 total iron.~~

7.2.d.30. Greenbrier River - (Reserved)

~~7.2.d.30.1. Water Use Category A and B2 shall not apply to that~~

~~segment of the East Fork of the Greenbrier River (KNG 78) from the reservoir located at the tannery to the confluence with the West Fork; Provided that all trout water (B2) standards shall not be violated in the mainstem Greenbrier River.~~

7.2.d.31. Bluestone River - (Reserved)

7.2.d.32. Bluestone Lake

7.2.d.32.1. Category E Water Uses are deleted in Bluestone Lake and temperature rise shall be limited to no more than 3°F above natural not to exceed 81°F at any time during the months of May through November and not to exceed 73°F at any time during December through April.

7.2.d.33. East River - (Reserved)

7.2.d.34. Guyandotte River - (Reserved)

7.2.d.35. Mud River - (Reserved)

7.2.d.36. Big Sandy River - (Reserved)

7.2.d.37. Tug Fork River - (Reserved)

§46-1-8. Specific Water Quality Criteria.

8.1. Charts of specific water quality criteria are included in Appendix E.

8.1.a. Specific state (i.e. total, total recoverable, valence, etc.) of any parameter to be analyzed shall follow 40 CFR 136, Guidelines Establishing Test Procedures for Analysis of Pollutants Under the Clean Water Act, as amended, June 15, 1990. (See also ~~Series II, Section 7.3 of these regulations~~ Section 7.3 of 47 CSR 10 - National Pollutant Discharge Elimination System (NPDES) Program)

8.1.b. An "X" or numerical value in the use columns of Appendix E shall represent the applicable criteria.

8.1.c. Charts of water quality criteria in Appendix E shall be applied in accordance with major stream and use applications, Sections 6 and 7.

8.2. Criteria for Toxicants.

8.2.a. Toxicants which are carcinogenic have human health criteria (Water Use Categories A and C) based upon an estimated risk level of one additional cancer case per one

million persons (10^{-6}) and are indicated in Appendix E with an endnote ([b]).

~~8.2.c.~~8.2.b. A final determination on the critical design flow for carcinogens is not made in this rule, in order to permit further review and study of that issue. Following the conclusion of such review and study, the Legislature may again take up the authorization of this rule for purposes of addressing the critical design flow for carcinogens: Provided, That until such time as the review and study of the issue is concluded or until such time as the Legislature may again take up the authorization of this rule, the regulatory requirements for determining effluent limits for carcinogens shall remain as they were on the date this rule was proposed.

8.3. Variances from Specific Water Quality Criteria. A variance from numeric criteria may be granted to a discharger if it can be demonstrated that the conditions outlined in subsections 6.1.b.A - F limit the attainment of one or more specific water quality criteria. Variances shall apply only to the discharger to whom they are granted and shall be reviewed by the Board at least every three years. In granting a variance, the requirements for revision of water quality standards in 46 CSR Series 6 shall be followed.

8.4. Site-specific numeric criteria. The Board may establish numeric criteria different from those set forth in Appendix E for a stream or stream segment upon a demonstration that existing numeric criteria are either over-protective or under-protective of the aquatic life residing in the stream or stream segment. A site-specific numeric criterion will be established only where the numeric criterion will be fully protective of the aquatic life and the existing and designated uses in the stream or stream segment. The site-specific numeric criterion may be established by conducting a Water Effects Ratio study pursuant to the procedures outlined in EPAs "Interim Guidance on the Determination and Use of Water-Effect Ratios for Metals" (February 1994); other methods may be used with prior approval by the Board. In adopting site-specific numeric criteria, the requirements for revision of water quality standards set forth in 46 CSR 6 shall be followed.

8.5. Implementation procedures for parameters with water quality criteria which are lower than the detection limit.

a. The implementation procedures outlined in this section and corresponding appendices apply to the following parameters of concern: chlordane, DDT, aldrin, dieldrin, endrin, toxaphene, PCB, dioxin and hexachlorobenzene.

b. The methods outlined in this section and corresponding appendices may be used for the following purposes:

A. For measuring background concentrations of the parameters of concern for the purpose of calculating effluent limits in National Pollutant Discharge Elimination System (NPDES) permits; and

B. For measuring background concentrations of the parameters of concern to determine whether a stream is meeting water quality for those parameters (ie: for compiling the 303(d) list)

c. For making the determinations outlined in section b for the parameters of concern outlined in section a above, the Chief may use or approve the use of any of the following methods:

A. Direct measurement of water concentrations.

i. High volume sampling method.

B. Indirect measurement of water concentrations

i. Back-calculation of water concentration from known fish tissue concentrations. The acceptable methods for back-calculation are outlined in Appendix F.

ii. Semi-permeable membrane method. Prior to using or approving the use of this method for the purposes and parameters outlined above, the Chief shall consult with USEPA, Region III.

d. Prior to implementation of any of the procedures outlined herein, a sampling protocol shall be submitted to the Chief for review and approval after consultation with the West Virginia Division of Natural Resources. In developing sampling protocols for any of the methods outlined herein the guidelines in the USEPA document entitled "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1, Fish Sampling and Analysis, Second Edition (EPA Document No. EPA 823-R-95-007, September 1997) shall be used.

§46-1-9. Establishment Of Safe Concentration Values.

When a specific water quality standard has not been established by these rules and there is a discharge or proposed discharge into waters of the State, the use of which has been designated a Category B1, B2, B3 or B4, such discharge may be regulated by the chief where necessary to protect State water through establishment of a safe concentration value as follows:

9.1. Establishment of a safe concentration value shall be based upon data obtained from relevant aquatic field studies, standard bioassay test data which exists in substantial available scientific literature, or data obtained from specific tests utilizing one (1) or more representative important species of aquatic life designated on a case-by-case basis by the chief and conducted in a water environment which is equal to or closely approximates that of the natural quality of the

receiving waters.

9.2. In those cases where it has been determined that there is insufficient available data to establish a safe concentration value for a pollutant, the safe concentration value shall be determined by applying the appropriate application factor as set forth below to the 96-hour LC 50 value. Except where the chief determines, based upon substantial available scientific data that an alternate application factor exists for a pollutant, the following appropriate application factors shall be used in the determination of safe concentration values:

9.2.a. Concentrations of pollutants or combinations of pollutants that are not persistent and not cumulative shall not exceed 0.10 (1/10) of the 96-hour LC 50.

9.2.b. Concentrations of pollutants or combinations of pollutants that are persistent or cumulative shall not exceed 0.01 (1/100) of the 96-hour LC 50.

9.3. Persons seeking issuance of a permit pursuant to these rules authorizing the discharge of a pollutant for which a safe concentration value is to be established using special bioassay tests pursuant to subsection 9.1 of this section shall perform such testing as approved by the chief and shall submit all of the following in writing to the chief:

9.3.a. A plan proposing the bioassay testing to be performed.

9.3.b. Such periodic progress reports of the testing as may be required by the chief.

9.3.c. A report of the completed results of such testing including, but not limited to, all data obtained during the course of testing, and all calculations made in the recording, collection, interpretation and evaluation of such data.

9.4. Bioassay testing shall be conducted in accordance with methodologies outlined in the following documents: U.S. EPA Office of Research and Development Series Publication, Methods for Measuring the Acute Toxicity (EPA/600/4-90/027F, August 1993, 4th Edition) or Short Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA/600/4-89/001), March 1989; Standard Methods for the Examination of Water and Wastewater (18th Edition); or ASTM Practice E 729-88 for Conducting Acute Toxicity Tests with Fishes, Macroinvertebrates and Amphibians as published in Volume 11.04 of the 1988 Annual Book of ASTM Standards. Test waters shall be reconstituted according to recommendations and methodologies specified in the previously cited references or methodologies approved in writing by the chief.

APPENDIX A
CATEGORY B-2 - TROUT WATERS

This list contains known trout waters and is not intended to exclude any waters which meet the definition in Section 2.16.

River Basin		County	Stream
James River			
	J	Monroe	South Fork Potts Creek
Potomac River			
	P	Jefferson	Town Run
	P	"	Rocky Marsh Run
	P	Berkeley	Opequon Creek
	P	"	Tuscarora Creek (Above Martinsburg)
	P	"	Middle Creek (Above Route 30 Bridge)
	P	"	Mill Creek
	P	"	Hartland Run
	P	"	Mill Run
	P	"	Tillance Creek
	P	Morgan	Meadow Branch
	PS	Jefferson	Flowing Springs Run (Above Halltown)
	PS	"	Cattail Run
	PS	"	Evitt's Run
	PS	"	Big Bullskin Run
	PS	"	Long Marsh Run
	PC	Hampshire	Cold Stream
	PC	"	Edwards Run and Impoundment
	PC	"	Dillons Run
	PC	Hardy	Lost River
	PC	"	Camp Branch
	PC	"	Lower Cove Run
	PC	"	Moores Run
	PC	"	North River (Above Rio)
	PC	"	Waites Run
	PC	"	Trout Run
	PC	"	Trout Pond (Impoundment)
	PC	"	Warden Lake (Impoundment)
	PC	"	Rock Cliff Lake (Impoundment)
	PSB	Hampshire	Mill Creek
	PSB	"	Mill Run
	PSB	Hardy	Dumpling Creek
	PSB	Grant-Pendleton	North Fork South Branch
	PSB	Grant	North Fork Lunice Creek
	PSB	"	South Fork Lunice Creek
	PSB	"	South Mill Creek (Above Hiser)
	PSB	"	Spring Run
	PSB	Pendleton	Hawes Run (Impoundment)
	PSB	"	Little Fork
	PSB	"	South Branch (Above North Fork)
	PSB	"	Senena Creek
	PSB	"	Laurel Fork
	PSB	"	Big Run
	PNB	Mineral	North Fork Patterson Creek
	PNB	"	Fort Ashby (Impoundment)
	PNB	"	New Creek
	PNB	"	New Creek Dam 14 (Impoundment)
	PNB	"	Mill Creek (Above Markwood)

Monongahela River

M	Monongalia-Marion	Whiteday Creek (Above Smithtown)
MC	Monongalia	Morgan Run
MC	"	Coopers Rock (Impoundment)
MC	"	Blaney Hollow
MC	Preston	Laurel Run
MC	"	Elsey Run
MC	"	Saltlick Creek
MC	"	Buffalo Creek
MC	"	Wolf Creek
MC	Tucker	Clover Run
MC	"	Elklick Run
MC	"	Horseshoe Run
MC	"	Maxwell Run
MC	"	Red Creek
MC	"	Slip Hill Mill Branch
MC	"	Thomas Park (Impoundment)
MC	"	Blackwater River (Above Davis)
MC	Randolph	Camp Five Run
MC	"	Dry Fork (Above Otter Creek)
MC	"	Glady Fork
MC	"	Laurel Fork
MC	"	Gandy Creek (Above Whitmer)
MC	"	East Fork Glady Fork (Above C & P Compressor Station)
MC	Randolph	Shavers Fork (Above Little Black Fork)
MC	"	Three Spring Run
MC	"	Spruce Knob Lake (Impoundment)
MW	Harrison	Dog Run (Pond)
MW	Lewis	Stonecoal
MT	Barbour	Brushy Fork (Above Valley Furnace)
MT	"	Teter Creek Lake (Impoundment)
MT	"	Mill Run
MT	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
MT	Preston	Roaring Creek (Above Little Lick Branch)
MT	Randolph	Tygart River (Above Huttonsville)
MT	"	Elkwater Fork
MT	"	Big Run
MTB	Upshur-Randolph-Lewis	Right Fork Buckhannon River
MTB	Upshur	Buckhannon River (Above Beans Mill)
MTB	Upshur	French Creek
MTB	Upshur-Randolph	Left Fork Right Fork
MTN	Upshur	Right Fork Middle Fork River
MTM	Randolph	Middle Fork River (Above Cassity)
MY	Preston	Rhine Creek

Little Kanawha River

LK	Upshur	Left Fork-Right Fork Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

Kanawha river

KE	Braxton	Sutton Reservoir
KE	"	Sutton Lake Tailwaters (Above Route 38/5 Bridge)
KE	Webster	Back Fork
KE	"	Desert Fork
KE	"	Fall Run
KE	"	Laurel Fork
KE	"	Left Fork Holly River
KE	"	Sugar Creek
KE	"	Elk River (Above Webster Springs)
KC	Raleigh	Stephens Lake (Impoundment)
KC	"	Marsh Fork (Above Sundial)

KG	Nicholas	Summersville Reservoir (Impoundment)
KG	"	Summersville Tailwaters (Above Collison Creek)
KG	Nicholas	Deer Creek
KG	Randolph-Webster	Gauley River (Above Moust Coal Tipple)
KG	Fayette	Glade Creek
KG	Nicholas	Hominy Creek
KG	"	Anglins Creek
KG	Greenbrier	Big Clear Creek
KG	"	Little Clear Creek and Laurel Run
KG	"	Meadow Creek
KG	Fayette	Wolf Creek
KG	Nicholas	Cherry River
KG	Greenbrier-Nicholas	Laurel Creek
KG	" "	North Fork Cherry River
KG	Greenbrier	Summit Lake (Impoundment)
KG	Greenbrier-Nicholas	South Fork Cherry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC	Pocahontas	South Fork Cranberry River
KGW	Pocahontas	Tea Creek
KGW	Pocahontas-Webster	Williams River (Above Dyer)
KN	Raleigh	Glade Creek
KN	Summers	Meadow Creek
KN	Fayette	Mill Creek
KN	"	Laurel Creek (Above Cotton Hill)
KN	Raleigh	Pinch Creek
KN	Monroe	Rich Creek
KN	"	Turkey Creek
KN	Fayette	Dunloup Creek (Downstream from Harvey Sewage Treatment Plant)
KN	Mercer	East River (Above Kelleysville)
KN	"	Pigeon Creek
KN	Monroe	Laurel Creek
KNG	Monroe	Kitchen Creek (Above Gap Mills)
KNG	Greenbrier	Culverson Creek
KNG	"	Milligan Creek
KNG	Greenbrier-Monroe	Second Creek (Rt. 219 Bridge to Nickell's Mill)
KNG	Greenbrier	North Fork Anthony Creek
KNG	"	Spring Creek
KNG	"	Anthony Creek (Above Big Draft)
KNG	Pocahontas	Watoga Lake
KNG	"	Beaver Creek
KNG	"	Knapp's Creek
KNG	"	Hills Creek
KNG	"	North Fork Deer Creek (Above Route 28/5)
KNG	"	Deer Creek
KNG	"	Sitlington Creek
KNG	"	Stoney Creek
KNG	"	Swago Creek
KNG	"	Buffalo Fork (Impoundment)
KNG	"	Seneca (Impoundment)
KNG	"	Greenbrier River (Above Hosterman)
KNG	"	West Fork-Greenbrier River (Above the impoundment at the tannery)
KNG	"	Little River-East Fork
KNG	"	Little River-West Fork
KNG	"	Five Mile Run
KNG	"	Mullenax Run
KNG	"	Abes Run
KNB	Mercer	Marsh Fork
KNB	"	Camp Creek
OG	Wyoming	Pinnacle creek
BST	McDowell	Dry Fork (Above Canebrake)

APPENDIX B

This list contains known waters used as public water supplies and is not intended to exclude any waters as described in Section 6.2.

River Basin		County	Operating Company	Source
Shenandoah River				
	S	Jefferson	Charlestown Water	Shenandoah River
Potomac River				
	P	Jefferson	3-M Company	Turkey Run
	P	"	Shepherdstown Water	Potomac River
	P	"	Harpers Ferry Water	Elk Run
	P	Berkeley	DuPont Potomac River Works	Potomac River
	P	"	Berkeley County PSD	Le Feure Spring
	P	"	Opequon PSD	Quarry Spring
	P	"	Hedgesville PSD	Speck Spring
	P	Morgan	Paw Paw Water	Potomac River
	PSB	Hampshire	Romney Water	South Branch Potomac River

PSB	"	Peterkin Conference Center	Mill Run
PSB	Hardy	Moorefield Municipal Water	South Fork River
PSB	Pendleton	U.S. Naval Radio Sta.	South Fork River
PSB	"	Circleville Water Inc.	North Fork of South Branch, Potomac River
PSB	Grant	Mountain Top PSD	Mill Creek, Impoundment
PSB	"	Petersburg Municipal Water	South Branch, Potomac River
PNB	Grant	Island Creek Coal	Impoundment
PNB	Mineral	Piedmont Municipal Water	Savage River, Maryland
PNB	"	Keyser Water	New Creek
PNB	"	Fort Ashby PSD	Lake

Monongahela River

M	Monongalia	Morgantown Water Comm.	Colburn Creek & Monongahela River
M	"	Morgantown Ordinance Works	Monongahela River
M	Preston	Preston County PSD	Deckers Creek
M	Monongalia	Blacksville # 1 Mine	Impoundment
M	"	Loveridge Mine	Impoundment
M	"	Consolidation Coal Co.	Impoundment
M	Preston	Mason Town Water	Block Run
MC	Preston	Fibair Inc.	Impoundment
MC	Monongalia	Cheat Neck PSD	Cheat Lake
MC	"	Lakeview County Club	Cheat Lake-Lake Lynn
MC	"	Union Districk PSD	Cheat Lake-Lake Lynn
MC	"	Cooper's Rock State Park	Impoundment
MC	Preston	Kingwood Water	Cheat River
MC	"	Hopemount State Hosp.	Snowy Creek
MC	"	Rowlesburg Water	Keyser Run & Cheat River
MC	"	Albright	Cheat River
MC	Tucker	Parsons Water	Shavers & Elk Lick Fork
MC	"	Thomas Municipal	Thomas Reservoir
MC	"	Hamrick PSD	Dry Fork
MC	"	Douglas Water System	Long Run
MC	Tucker	Davis Water	Blackwater River
MC	"	Hambleton Water System	Roaring Creek
MC	"	Canaan Valley State Park	Blackwater River
MC	Pocahontas	Cheat Mt. Sewer	Shavers Lake
MC	"	Snowshoe Co. Water	Shavers Fork
MC	Randolph	Womelsdorf Water	Yokum Run
MW	Harrison	Lumberport Water	Jones Run
MW	"	Clarksburg Water Bd.	West Fork River
MW	"	Bridgeport Mun. Water	Deecons & Hinkle Creek
MW	"	Salem Water Board	Dog Run
MW	"	West Milford Water	West Fork Ricer
MW	Lewis	W.V. Water-Weston District	West Fork River
MW	"	Jackson's Mill Camp	Impoundment
MW	"	West Fork River PSD	West Fork River
MW	"	Kennedy Compresssor Station	West Fork River
MW	"	Jane Lew Water Comm.	Hackers Creek
MW	Harrison	Bel-Meadow Country Club	Lake
MW	"	Harrison Power Station	West Fork River
MW	"	Oakdale Portal	Impoundment
MW	"	Robinson Port	Impoundment
MT	Marion	Fairmont Water Comm.	Tygart River
MT	"	Mannington Water	Impoundment
MT	"	Monongah Water Works	Tygart River
MT	"	Eastern Assoc. Coal Corp.	Impoundment

	MT	"	Four States Water	Impoundment
	MT	Harrison	Shinnston Water Dept.	Tygart River
	MT	Taylor	Grafton Water	Tygart River-Lake
	MT	Barbour	Phillippi Water	Tygart River
	MT	"	Bethlehem Mines Corp.	Impoundment
	MT	"	Belington Water Works	Tygart River & Mill Run Lake
	MT	Randolph	Elkins Municipal Water	Tygart River
	MT	"	Beverly Water	Tygart river
	MT	"	Valley Water	Tygart River
	MT	"	Huttonsville Medium Security Prison	Tygart River
	MT	"	Mill Creek Water	Mill Creek
	MTB	Upshur	Buckhannon Water Board	Buckhannon River
Ohio River				
O	Zone 1	Hancock	Chester Water & Sewer	Ohio River
O	"	Brooke	City of Weirton	Ohio River
O	"	"	Weirton Steel Division	Ohio River
O	"	Ohio	Wheeling Water	Ohio River
O	"	Tyler	Sistersville Mun. Water	Ohio River
O	"	Pleasants	Pleasants Power Station	Ohio River
O	"	Cabel	Huntington Water Corp.	Ohio River
O	"	Marshall	Mobay Chemical Co.	Ohio River
O	"	Wood	E. I. DuPont	Ohio River
O	Zone 2	Marshall	Cameron Water	Glass House Hollow
O	"	"	New Urindahana Water System	Wheeling Creek
O	"	Wetzel	Pine Grove Water	North Fork, Fishing Creek
O	"	Marshall	Consolidated Coal Co.	Impoundment
O	"	Tyler	Middlebourne Water	Middle Island Creek
O	"	Doddridge	West Union Mun. Water	Middle Island Creek
O	"	Mason	Hidden Valley Country	Lake/Impoundment
O	"	Jackson	Ripley Water	Mill Creek
lO	"	Wayne	Wayne Municipal Water	Twelve Pole Creek
O	"	"	East Lynn Lake	East Lynn Lake
O	Zone 2	Wayne	Monterey Coal Co.	Impoundment
Little Kanawha				
	LK	Wood	Claywood Park PSD	Little Kanawha River
	LK	Calhoun	Grantsville Mun. Water	Little Kanawha River
	LK	Gilmer	Glenville Utility	Little Kanawha River
	LK	"	Consolidated Gas Compressor	Steer Creek
	LK	Braxton	Burnsville Water Works	Little Kanawha river
	LK	Roane	Spencer Water	Spring Creek & Mile Tree Reservoir
	LK	Wirt	Elizabeth Water	Little Kanawha River
	LKH	Ritchie	Cairo Water	North Fork Hughes River
	LKH	"	Harrisville Water	North Fork Hughes River
	LKH	"	Pennsboro Water	North Fork Hughes River
Kanawha River				
	K	Putnam	Buffalo Water	Cross Creek
	K	"	Winfield Water	Poplar Fork & Crooked Creek
	K	"	South Putnam PSD	Poplar Fork & Crooked Creek
	K	Kanawha	Cedar Grove Water	Kanawha River
	K	"	Pratt Water	Kanawha River
	K	Fayette	Armstrong PSD PO-K1-CO-EL	Kanawha River & Gum Hollow
	K	"	Kanawha Water Co.- Beards Fork	Unnamed Tributary Kanawha River
	K	Kanawha	Midland Trail School	Impoundment
	k	"	Cedar Coal Co.	Impoundment
	K	Fayette	Elkem Metals Co.	Kanawha River
	K	"	Deepwater PSD	Kanawha River
	K	"	Kanawha Falls PSD	Kanawha River
	K	"	W.V. Water-Montgomery	Kanawha River

Pocatalico river

KP	Kanawha	Sissonville PSD	Pocatalico River
KP	Roane	Walton PSD	Silcott Fork Dam

Coal River

KC	Kanawha	St. Albans Water	Coal River
KC	"	Washington PSD	Coal River
KC	Lincoln	Lincoln PSD	Coal River
KC	Boone	Coal River PSD	Coal River
KC	"	Whitesville PSD	Coal River
KC	Raleigh	Armco Mine 10	Marsh Fork
KC	"	Armco Steel-Montc. Stickney	Coal River
KC	Raleigh	Peabody Coal	Coal River
KC	"	Stephens Lake Park	Lake Stephens
KC	Boone	W.V. Water-Madison Dist.	Little Coal River
KC	"	Van PSD	Pond Fork
KC	Raleigh	Consol. Coal Co.	Workmans Creek
KC	Boone	Water Ways Park	Coal River

Elk River

KE	Kanawha	Clendenin Water	Elk River
KE	"	W.V. Water-Kanawha Valley District	Elk River
KE	Kanawha	Pinch PSD	Elk River
KE	Clay	Clay Waterworks	Elk River
KE	"	Procious PSD	Elk River
KE	Braxton	Flatwoods-Canoe Run PSD	Elk River
KE	"	Sugar Creek PSD	Elk River
KE	"	W.V. Water-Gassaway Dist.	Elk River
KE	"	W.V. Water-Sutton Dist.	Elk River
KE	Webster	W.V. Water-Webster Springs	Elk River
KE		Holly River State Park	Holly River

Gauley River

KG	Nicholas	Craigsville PSD	Gauley River
KG	"	Summersville Water	Impoundment/Muddlety Creek
KG	"	Nettie-Leivasy PSD	Jim Branch
KG	Webster	Cowen PSD	Gauley River
KG	Nicholas	Wilderness PSD	Anglins Creek & Meadow River
KG	"	Richwood Water	North Fork Cherry River

New river

KN	Fayette	Ames Heights Water	Mill Creek
KN	"	Mt. Hope Water	Impounded Mine (Surface)
KN	"	Ansted Municipal Water	Mill Creek
KN	"	Fayette Co. Park	Impoundment
KN	"	New River Gorge Campground	Impoundment
KN	"	Fayetteville Water	Wolfe Creek
KN	Raleigh	Beckley Water	Glade Creek
KN	"	Westmoreland Coal Co.	Farley Branch

Bluestone River

KNB	Summers	Jumping Branch-Nimitz	Mt. Valley Lake
KNB	"	Bluestone Conf. Center	Bluestone Lake
KNB	"	Pipestem State Park	Impoundment
KNB	Mercer	Town of Athens	Impoundment
KNB	"	Bluewell PSD	Impoundment
KNB	"	Bramwell Water	Impoundment
KNB	"	Green Valley-Glenwood PSD	Bailey Reservoir
KNB	"	Kelly's Tank	Spring
KNB	"	W.V. Water Princeton	Impoundment/Brusch Creek
KNB	"	Lashmeet PSD	Impoundment

KNB	"	Pinnacle Water Assoc.	Mine
KNB	"	W.V. Water Bluefield	Impoundment
Greenbrier River			
KNG	Summers	W.V. Water Hinton	Greenbrier River & New River
KNG	"	Big Bend PSD	Greenbrier River
KNG	Greenbrier	Alderson Water Dept.	Greenbrier River
KNG	"	Ronceverte Water	Greenbrier River
KNG	"	Lewisburg Water	Greenbrier river
KNG	Pocahontas	Denmar State Hospital Water	Greenbrier River
KNG	"	City of Marlinton Water	Knapp Creek
KNG	"	Cass Scenic Railroad	Leatherbark Creek
KNG	"	Upper Greenbrier PSD	Greenbrier River
KNG	"	The Hermitage	Greenbrier
Guyandotte River			
OG	Cabell	Salt Rock PSD	Guyandotte River
OG	Lincoln	West Hamlin Water	Guyandotte Rriver
OG	Logan	Logan Water Board	Guyandotte River
OG	"	Man Water Works	Guyandotte River
OG	"	Buffalo Creek PSD	Buffalo Creek/ Mine/Wells
OG	Logan	Chapmanville	Guyandotte River
OG	"	Logan PSD	Whitman Creek/ Guyandotte River
OG	Mingo	Gilbert Water	Guyandotte River
OG	Wyoming	Oceana Water	Laurel Fork
OG	"	Glen Rogers PSD	Impoundment
OG	"	Pineville Water	Pinnacle Creek/ Guyandotte River
OG	Raleigh	Raleigh Co. PSD-Amigo	Tommy Creek
OMG	Cabell	Milton Water Works	Guyandotte River
OMG	"	Culloden PSD	Indian Fork Creek
OMG	Putnam	Hurricane Municipal Water	Impoundment
OMG	"	Lake Washington PSD	Lake Washington
Big Sandy River			
BS	Wayne	Kenova Municipal Water	Big Sandy River
BS	"	Fort Gay Water	Tug Fork
BST	Mingo	Kermit Water	Tug Fork
BST	"	Matewan Water	Tug Fork
BST	"	A & H Coal Co., Inc.	Impoundment
BST	"	Williamson Water	Impoundment
BST	McDowell	City of Welch	Impoundment/Wells
BST	"	City of Gary	Impoundment/Mine

APPENDIX C

CATEGORY E-3 - POWER PRODUCTION

This list contains known power production facilities and is not intended to exclude any waters as described in Section 6.6.c.

River Basin	County	Station Name	Operating Company
Monongahela River			
M	Monongalia	Fort Martin Power Station	Monongahela Power
M	Marion	Rivesville Station	Monongahela Power
MC	Preston	Albright Station	Monongahela Power
Potomac	Grant	Mt. Storm Power Station	Virginia Electric & Power Company
Ohio River			
O - Zone 1	Wetzel	Hannibal (Hydro)	Ohio Power
O " "	Marshall	Kamer	Ohio Power
O " "	"	Mitchell	Ohio Power
O " "	Pleasants	Pleasants Station	Monongahela Power
O " "	"	Willow Island Station	Monongahela Power
O " "	Mason	Phillip Sporn Plant	Central Operating (AEP)
O " "	"	Racine (Hydro)	Ohio Power
O " "	"	Mountaineer	Appalachian Power Co.
K	Putnam	Winfield (Hydro)	Appalachian Power Co.
K	Kanawha	Marmet (Hydro)	Appalachian Power Co.
K	"	London (Hydro)	Appalachian Power Co.
K	"	Kanawha River	Appalachian Power Co.
K	"	John E. Amos	Appalachian Power Co.

APPENDIX D

CATEGORY C - WATER CONTACT RECREATION

This list contains waters known to be used for water contact recreation and is not intended to exclude any waters as described in Section 6.4.

River Basin	Stream Code	Stream	County
Shenandoah	S	Shenandoah River	Jefferson
Potomac	P	Potomac River	Jefferson
	P	" "	Hampshire
	P	" "	Berkeley
	P	" "	Morgan
	P-9	Sleepy Creek & Meadow Branch	Berkeley
	P-9-G-1	North Fork of Indian Run	Morgan
South Branch	PSB	South Branch of Potomac River	Hampshire
	PSB	" "	Hardy
	PSB	" "	Grant
	PSB-21-X	Hawes Run	Pendleton
	PSB-25-C-2	Spring Run	Grant
	PSB-28	North Fork South Branch Potomac River	Grant
North Branch	PNB	North Branch of Potomac River	Mineral
	PNB-4-EE	North Fork Patterson Creek	Grant
	PNB-7-H	Linton Creek	Grant
	PNB-17	Stoney River-Mt. Storm Lake	Grant
	PC	Cacapon River	Hampshire
Monongalia			
Cheat	MC	Cheat Lake/Cheat river	Monongalia/Preston
	MC	Alpine Lake	Preston
	MC-6	Coopers Rock Lake/ Quarry Run	Monongalia
	MC-12	Big Sandy Creek	Preston
	MSC	Shavers Fork	Randolph
	MTN	Middle Fork River	Barbour/Randolph/ Upshur
	MW	West Fork River	Harrison
	MW-18	Stonecoal Creek/	Lewis

		Stonecoal Lake	
Ohio	O	Ohio River	Brooke/Cabell/ Hancock/Jackson/ Marshall/Mason/ Ohio/Pleasants/ Tyler/Wayne/Wood/ Wetzel
	O-2-H	Beech Fork of Twelvepole Creek/Beech Fork Lake	Wayne
	O-2-Q	East Fork of Twelvepole Creek/East Lynn Lake	Wayne
	O-3	Fourpole Creek	Cabell
	O-21	Old Town Creek/ McClintic Ponds	Mason
	OMi	Middle Island Creek/ Crystal Lake	Doddridge
	OG	Guyandotte River	Cabell
	OG	Guyandotte River/ R. D. Bailey Lake	Wyoming
	OGM	Mud River	Cabell
Little Kanawha	LK	Little Kanawha River/ Burnsville Lake	Braxton
Kanawha	K	Kanawha River	Fayette/Kanawha/ Mason/Putnam
	K-1	Unnamed Tributary Krodel Lake	Mason
	KC	Coal River	Kanawha
	KC-45-Q	Stephens Branch/ Lake Stephens	Raleigh
	KE	Elk River	Kanawha/Clay/ Braxton/Webster/ Randolph
	KE	Sutton lake	Braxton
	KN	New River	Fayette/Raleigh/ Summers
	KN-26-F	Little Beaver Creek	Raleigh
	KNG	Greenbrier River	Greenbrier/Pocahontas/ Summers
	KNG-23-E-1	Little Devil Creek/ Moncove Lake	Monroe
	KNG-28	Anthony Creek	Greenbrier
	KNG-28-P	Meadow Creek/ Lake Sherwood	Greenbrier
	KNB	Bluestone River/ Bluestone Lake	Summers
	KG	Gauley River	Webster
	KG	Gauley River/ Summersville Lake	Nicholas
	KGW	Williams River	Webster

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.1 Aluminum (ug/l) Not to exceed:(See ~~7.1.d.B(b)~~ 7.2.d.	750	~~87~~	750	~~87~~			
8.2 Ammonia (ug/l): Un-ionized ammonia (UA) shall be determined from values of total ammonia-N, pH and temperature according to the following equation: $UA = \frac{1.2(\text{total ammonia-N})}{1+10^{(pka-pH)}}$ where pka = 0.0902 + 2730/(273.2 + T) and T = temperature (°C) The concentration of un-ionized ammonia (NH3) shall not exceed 50 ug/l.						50	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.2.1 Acute and chronic aquatic life criteria for ammonia shall be determined using the tables and formulae in the National Criteria section of USEPAs Ambient Water Quality Criteria for Ammonia - 1984 (EPA 440/5-85-001, January 1985)	X	X	X	X			
8.3 Antimony (ug/l) Not to exceed:					4300	14	
8.4 Arsenic[b] (ug/l) Not to exceed:					50	50	100
8.4.1 Trivalent Arsenic Not to exceed:	360	190	360	190			
8.5 Barium (mg/l) Not to exceed:						1.0	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.6 Beryllium (ug/l)	130	~~130~~	130	~~130~~		.0077	
8.7 Cadmium (ug/l) Hardness Soluble Cd (mg/l $CaCO_3$) 0 - 35 1.0 36 - 75 2.0 76 - 150 5.0 > 150 10.0						X	
8.7.1 Not to exceed 10 ug/l in the Ohio River (O Zone 1) main stem (see section 7.1.d)						X	
8.7.3 The four-day average concentration of total recoverable cadmium shall not exceed the value determined by the following equation: $Cd = e^{(0.7852[\ln(\text{hardness})]-3.490)}$		X		X			

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.7.4 The one-hour average concentration of total recoverable cadmium shall not exceed the value determined by the following equation: $Cd = e^{(1.128[\ln(hardness)]-3.828)}$	X		X				
8.8 Chloride (mg/l) Not to exceed:	860	230	860	230	250	250	
8.9 Copper (ug/l) Not to exceed:						1000	
8.9.1 The four-day average concentration of total recoverable copper shall not exceed the value determined by the following equation[a]: $Cu = e^{(0.8545[\ln(hardness)]-1.465)}$		X		X			

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.9.2 The one-hour average concentration of total recoverable copper shall not exceed the value determined by the following equation [a]: $Cu = e^{(0.9422[\ln(hardness)]-1.464)}$	X		X				
8.10 Cyanide (ug/l) (As free cyanide $HCN+CN^-$) Not to exceed:	22	5.0	22	5.0	5.0	5.0	
8.11 Dissolved Oxygen[c]: not less than 5 mg/l at any time.	X				X	X	X
8.11.1 Kanawha River main stem, Zone 1 - Not less than 4.0 mg/l at any time.	X						

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.11.2 Ohio River main stem - the average concentration shall not be less than 5.0 mg/l per calendar day and shall not be less than 4.0 mg/l at any time or place outside any established mixing zone - provided that a minimum of 5.0 mg/l at any time is maintained during the April 15-June 15 spawning season.	X						
8.11.3. Not less than 7.0 mg/l in spawning areas and in no case less than 6.0 mg/l at any time.			X				

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.12 Fecal Coliform: Maximum allowable level of fecal coliform content for Primary Contact Recreation (either MPN or MF) shall not exceed 200/100 ml as a monthly geometric mean based on not less than 5 samples per month; nor to exceed 400/100 ml in more than ten percent of all samples taken during the month.					X	X	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.12.1 Ohio River main stem (zone 1) - During the non-recreational season (November through April only) the maximum allowable level of fecal coliform for the Ohio River (either MPN or MF) shall not exceed 2000/100 ml as a monthly geometric mean based on not less than 5 samples per month.					X		
8.13 Fluoride (mg/l) Not to exceed:						1.4	
8.13.1 Not to exceed 2.0 for category D uses							X
8.14 Hexavalent chromium (ug/l) Not to exceed:	16	11	16	7.2		50	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.15 Iron[c] (mg/l) Not to exceed:		1.5		0.5		1.5	
~~8.15.1 Effluent limitations which may result in a concentration of up to 3.5 mg/l total iron in the stream are allowable upon a demonstration to the Chief by the applicant that such concentration will not have an adverse impact upon designated stream uses. This demonstration is subject to EPA approval and must show either: (1) that the stream is supporting designated uses while containing total iron concentrations higher than the applicable criteria or (2) the stream does not have an aquatic life use to protect. Notwithstanding Section 4 herein, this demonstration shall be the only demonstration required before the Chief and the Board with respect to~~							

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~water quality-related effluent limitations. This exception does not apply to trout waters.~~		~~X~~					
8.16 Lead (ug/l) Not to exceed:						50	
8.16.1 The four-day average concentration of total recoverable lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[\ln(hardness)]-4.705)}$		X		X			
8.16.2 The one-hour average concentration of total recoverable lead shall not exceed the value determined by the following equation[a]: $Pb = e^{(1.273[\ln(hardness)]-1.46)}$	X		X				
8.17 Manganese (mg/l) Not to exceed:		~~1.0~~		~~1.0~~		1.0	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.17.1 Effluent limitations which may result in a concentration up to 2.0 mg/l Mn in the stream are allowable upon a demonstration to the Chief by the applicant that such concentration will not have an adverse impact upon designated stream uses. This demonstration is subject to EPA approval and must show either: (1) the stream is supporting designated uses while containing Mn concentrations higher than the applicable criteria, or (2) the stream does not have an aquatic life use to protect. Notwithstanding § 4 herein this demonstration shall be the only one required before the Chief and Board regarding water quality related effluent limitations.~~							

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.18 Mercury The total organism body burden of any aquatic species shall not exceed 0.5 ug/g as methylmercury.					0.5	0.5	
8.18.1 Total mercury in any unfiltered water sample shall not exceed (ug/l):	2.4		2.4		0.15	0.14	
8.18.2 Methylmercury (water column) Not to exceed (ug/l):		.012		.012			
8.19 Nickel (ug/l) Not to exceed:				~~50~~	4600	510	
8.19.1 The four-day average concentration of nickel shall not exceed the value determined by the following equation[a]: $Ni = e^{(0.846[\ln(\text{hardness})]+1.1645)}$		X		X			

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.19.2 The one-hour average concentration of total recoverable nickel shall not exceed the value determined by the following equation[a]: $Ni = e^{(0.846[\ln(\text{hardness})]+3.361)}$	X		X				
8.20 Nitrate (as Nitrate-N) (mg/l)						10	
8.21 Nitrite (as Nitrite -N) (mg/l) Not to exceed:	1.0		.060				
8.22 Organics							
Chlordane[b] (ng/l)	2400	4.3	2400	4.3	0.46	0.46	0.46
DDT[b] (ng/l)	1100	1.0	1100	1.0	0.024	0.024	0.024
Aldrin[b] (ng/l)	3.0	~~0.071~~	3.0	~~0.071~~	0.071	0.071	0.071
Dieldrin[b] (ng/l)	2500	1.9	2500	1.9	0.071	0.071	0.071
Endrin (ng/l)	180	2.3	180	2.3	2.3	2.3	2.3

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
Toxaphene[b] (ng/l)	730	0.2	730	0.2	0.73	0.73	0.73
PCB[b] (ng/l)		14.0		14.0	0.045	0.044	0.045
Methoxychlor (ug/l)		0.03		0.03	0.03	0.03	0.03
Dioxin (2,3,7,8-TCDD)[b] (pg/l)					0.014	0.013	0.014
Acrylonitrile[b] (ug/l)					0.66	0.059	
Benzene[b] (ug/l)					71	0.66	
1,2-dichlorobenzene (mg/l)					17	2.7	
1,3-dichlorobenzene (mg/l)					2.6	0.4	
1,4-dichlorobenzene (mg/l)					2.6	0.4	
2,4-dinitrotoluene[b] (ug/l)					9.1	0.11	
Hexachlorobenzene[b] (ng/l)					0.77	0.72	
Carbon tetrachloride[b] (ug/l)					4.4	0.25	
Chloroform[b] (ug/l)	28,900	~~15.7~~ 1,240	28,900	~~15.7~~ 1,240	470	0.19	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
Halomethanes (ug/l)					15.7	0.19	
1,2-dichloroethane[b] (ug/l)					99	0.035	
1,1,1- trichloroethane[b] (mg/l)						12	
1,1,2,2-tetrachloroethane (ug/l)		~~10.7~~ 2400		~~10.7~~ 2400	11	0.17	
1,1-dichloroethylene[b] (ug/l)					3.2	0.03	
Trichloroethylene[b] (ug/l)					81	2.7	
Tetrachloroethylene[b] (ug/l)					8.85	0.8	
Toluene[b] (mg/l)					200	6.8	
Polynuclear Aromatic Hydrocarbons (PAH)[b] (ug/l)					0.031	.0028	
Phthalate esters (ug/l)		3.0		3.0			
Vinyl chloride[b] (chloroethene)(ug/l)					525	2.0	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
alpa-BHC (alpha-Hexachloro-cyclohexane) [b] (ug/l)					0.013	.0039	
beta-BHC(beta-Hexachloro-cyclohexane)[b] (ug/l)					0.046	0.014	
gamma-BHC (gamma-Hexachloro-cyclohexane)[b] (ug/l)	2.0	0.08	2.0	0.08	0.063	0.019	
Chlorobenzene (mg/l)					21	0.68	
Ethylbenzene (mg/l)					29	3.1	
Heptachlor[b] (ng/l)	520	3.8	520	3.8	0.21	0.21	
2-methyl-4,6-Dinitrophenol (ug/l)					765	13.4	
Fluoranthene (ug/l)					370	300	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.22.1 The organic chemicals listed in §8.22 shall not exceed the specified water quality criteria. When the specified criteria are less than the practical laboratory quantification level, instream values will be calculated from discharge concentrations and flow rates and from fish body burden, where applicable.~~							

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.22.2~~ ~~The following body burden criteria shall not be exceeded in edible tissues of fish:~~ ~~Parameter Body Burden~~ ~~Chlordane 1.0 (ug/g)~~ ~~DDT 0.1 (ug/g)~~ ~~Aldrin~~ ~~Dieldrin 0.3 (ug/g)~~ ~~Endrin 0.3 (ug/g)~~ ~~Toxaphene 1.0 (ug/g)~~ ~~PCB 2.0 (ug/g)~~ ~~Dioxin 6.4 (pg/g)~~							
8.23 pH[c] No values below 6.0 nor above 9.0. Higher values due to photosynthetic activity may be tolerated.	X	X	X	X	X	X	X
8.24 ~~Phenolic materials~~ Phenol (ug/l) (Except Category A) Not to exceed:	~~5~~ 10,200	~~5~~ 2,560	~~5~~ 10,200	~~5~~ 2,560		~~5~~ 3.5 mg/l	

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.25 Radioactivity: Gross Beta activity not to exceed 1000 picocuries per liter (pCi/l), nor shall activity from dissolved strontium-90 exceed 10 pCi/l, nor shall activity from dissolved alpha emitters exceed 3 pCi/l.		X	X		X	X	X

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.25.1 Gross total alpha particle activity (including radium-226 but excluding radon and uranium shall not exceed 15 pCi/l and combined radium-226 and radium-228 shall not exceed 5pCi/l; provided that the specific determination of radium-226 and radium-228 are not required if dissolved particle activity does not exceed 5pCi/l; the concentration of tritium shall not exceed 20,000 pCi/l; the concentration of total strontium-90 shall not exceed 8 pCi/l in the Ohio River main stem.	X		X		X	X	X

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.26 Selenium (ug/l) Not to exceed:	20	5	20	5		10	
8.27 Silver Hardness Silver (ug/l) 0-50 1 51-100 4 101-200 12 >201 24				X		X	
8.27.1 0-50 1 51-100 4 101-200 12 201-400 24 401-500 30 501-600 43		X					
8.27.2 The one-hour average concentration of total recoverable silver shall not exceed the value determined by the following equation: $Ag=e^{(1.72[\ln(hardness)]-6.52)}$	X		x				

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28 Temperature Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 87°F at any time during months of May through November and not to exceed 73°F at any time during the months of December through April. During any month of the year, heat should not be added to a stream in excess of the amount that will raise the temperature of the water more than 5°F above natural temperature. In lakes and reservoirs, the temperature of the epilimnion should not be raised more than 3°F by the addition of heat of artificial origin. The normal daily and seasonable temperature fluctuations that existed before the addition of heat due to other natural causes should be maintained.							

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.1 For the Kanawha River Main Stem (K-1): Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 90°F in any case.	X						
8.28.2 For the Bluestone R (KNB), Bluestone Lake (KN-60) East River (KNE), New River (KN), Gauley R. (KG) and Greenbrier River (KNG): Temperature rise shall be limited to no more than 5°F above natural temperature, not to exceed 81°F at any time during the months of May through November and not to exceed 73°F at any time during December through April.			X				

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.3 No heated effluents will be discharged in the vicinity of spawning areas. The maximum temperatures for cold waters are expressed in the following table: Daily Mean °F / Hourly Max °F Oct-Apr 50 55 Sep-May 58 62 Jun-Aug 66 70			X				

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.28.4 For Ohio River Main Stem (01)(Section 7.1.d): Period Inst. Dates Ave. Max. Jan 1-31 45°F 50°F February 45 50 March 1-15 51 56 March 16-31 54 59 April 1-15 58 64 April 16-30 64 69 May 1-15 68 73 May 16-31 75 80 June 1-15 80 85 June 16-30 83 87 July 1-31 84 89 August 1-31 84 89 Sept 1-15 84 87 Sept 16-30 82 86 Oct 1-15 77 82 Oct 16-31 72 77 Nov 1-30 67 72 Dec 1-31 52 57	X						
8.29 Thallium (ug/l)					6.3	1.7	

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.30 Threshold odor[c] Not to exceed a threshold odor number of 8 at 104°F as a daily average.		X		X	X	X	
8.31 Total Residual Chlorine (ug/l - measured by amperometric or equivalent method) Not to exceed:	19	11			~~10~~	~~10~~	
8.31.1 No chlorinated discharge allowed			X				
8.32 Turbidity No point or non-point source to West Virginia's waters shall contribute a net load of suspended matter such that the turbidity exceeds 10 NTU's over background turbidity when the background is 50 NTU or less, or have more than a 10% increase in turbidity (plus 10 NTU minimum) when the background turbidity is more than 50 NTUs.							

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
This limitation shall apply to all earth disturbance activities and shall be determined by measuring stream quality directly above and below the area where drainage from such activity enters the affected stream. Any earth disturbing activity continuously or intermittently carried on by the same or associated persons on the same stream or tributary segment shall be allowed a single net loading increase.		X		X	X	X	

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.32.1 This rule shall not apply to those activities at which Best Management Practices in accordance with the State's adopted 208 Water Quality Management Plan are being utilized, maintained and completed on a site specific basis as determined by the appropriate 208 cooperative or an approved Federal or State Surface Mining Permit is in effect. This exemption shall not apply to Trout Waters.		X			X	X	
~~8.33 Zinc:~~ ~~Hardness Zinc~~ ~~mg/l CaCo3 ug/l~~ ~~0-50 50~~ ~~151-300 100~~ ~~301-400 300~~ ~~>401 600~~						~~X~~	

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.33.~~1~~ Zinc: The four-day average concentration of total recoverable zinc shall not exceed the value determined by the following equation[a]: $Zn = e^{(0.8473[\ln(hardness)]+0.7614)}$		X		X			
~~8.33.2~~ 8.33.1 The one-hour average concentration of total recoverable zinc shall not exceed the value determined by the following equation[a]: $Zn = e^{(0.8473[\ln(hardness)]+0.8604)}$	X		X				

APPENDIX E

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, ~~B3~~, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			

[1] One hour average concentration not to be exceeded more than once every three years on the average, unless otherwise noted.

[2] Four-day average concentration not to be exceeded more than once every three years on the average, unless otherwise noted.

[3] These criteria have been calculated to protect human health from toxic effects through fish consumption, unless otherwise noted.

[4] These criteria have been calculated to protect human health from toxic effects through drinking water and fish consumption, unless otherwise noted.

[a] Hardness as calcium carbonate (mg/l). The minimum hardness allowed for use is this equation shall not be less than 25 mg/l, even if the actual ambient hardness is less than 25 mg/l The maximum hardness value for use in this equation shall not exceed 400 mg.l even if the actual hardness is greater than 400 mg/l.

[b] Known or suspected carcinogen. Human health standards are for a risk level of 10^{-6}

[c] May not be applicable to wetlands (B4) - site-specific criteria are desirable.

APPENDIX F: Procedure for Calculating Instream Concentrations of Bioaccumulative Chemicals of Concern (BCCs) From Fish Tissue Concentrations[1]

DATA REQUIRED

*Average concentration of BCC from composite fish tissue samples.[2]

*Average percent lipids concentration of composite fish tissue samples.

*Average concentration of dissolved organic carbon (DOC)[3] .

*Average concentration of particulate organic carbon (POC)[3].

REFERENCE DATA REQUIRED:

*Log K_{ow} (See Table F-2)

*Default baseline bioaccumulation factor (BAF) for trophic level 3 or 4 (See Table F-1) or a site-specific BAF derived using methods approved by the Chief

CALCULATIONS [4]:

Calculate lipid normalized BCC concentration in fish tissue:

$$C_l = \frac{C_t}{f_t}$$

---

[1]This procedure is taken from the Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors (EPA-820-B-95-005) March 1995.

[2]In developing sampling protocols for the collection of fish tissues, "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1, Fish Sampling and Analysis" Second Edition (#EPA 823-R-95-007, September 1997) shall be used.

[3]The Chief shall establish the average concentration of DOC and POC from one of the following sources in descending order of priority 1) the fish sampling location, 2) a representative waterbody, or 3) a default value of statewide average. The DOC and POC values used in these calculations must be collected at the same time. (Note convert mg/l to kg/l for use in the calculation below)

[4]Proposed Water Quality Criteria Methodology Revision: Human Health, Draft Environmental Protection Agency, September 20, 1996.

Calculate freely dissolved fraction of BCC in water column:

$$f_{fd} = \frac{1}{(1 + POC \cdot K_{ow}) + (DOC \cdot \frac{K_{ow}}{10})}$$

Express baseline BAF on the basis of total BCC:

$$BAF^{t_l} = BAF^{fd_l}(f_{fd})$$

Calculate instream concentration of BCC:

$$C^{t_w} = \frac{C_l}{BAF^{t_l}}$$

DEFINITION OF TERMS:

POC = concentration of particulate organic carbon (kg/l)
DOC = concentration of dissolved organic carbon (kg/l)
K_{ow} = n-octanol water partition coefficient for the chemical
C_t = concentration of the chemical in the wet tissue either whole organism or specified tissue (ug/g).
C_l = lipid-normalized concentration of the chemical in tissues of the biota (ug/g lipid).
C^t_w = total concentration of chemical in the water (kg/l).
f_l = fraction lipid content in the organism.
f_{fd} = fraction of the total chemical that is freely dissolved in the water.
Baseline BAF = generalized BAF for a specific trophic level, based on the total chemical concentration in the water column, and normalized to 100% lipid.
BAF^{fd}_l = BAF (L/kg lipid) reported on the basis of the lipid-normalized concentration of chemical in the biota (kg/kg lipid) divided by the freely dissolve concentration of the chemical in the water (kg/L).
BAF_l = BAF (L/kg lipid) reported on the basis of the lipid-normalized concentration of chemical in the biota (kg/kg lipid) divided by the total concentration of the chemical in the water (kg/L).

TABLE F-1: Human Health BAFs

Chemical	Trophic Level 3	Trophic Level 4	Method[a]
	Baseline BAF (BAF_i^{fd})	Baseline BAF (BAF_i^{fd})	
aldrin	3,035,905	4,600,499	3
chlordane	7,943,000[b]	6,166,000	1
DDT	34,670,000[b]	60,260,000	1
dieldrin	4,180,000[c,d]	19,300,000	2
endrin	325,440	247,809	4
PCBs	55,280,000	116,600,000	1
2,3,7,8-TCDD	9,360,000[c]	9,000,000	2
toxaphene	27,510,000[e]	21,580,000	1
hexachlor-obenzene	2,630,000	2,512,000	

[a] The methods used to calculate the recommended baseline BAFs for trophic level 4 were:
1 = A measured baseline BAF was based on field-measured BAF.
2 = A predicted baseline BAF was based on field-measured BSAF methodology.
3 = A predicted baseline BAF was based on a laboratory-measured BCF and a Food-Chain Multiplier (FCM)
4 = A predicted baseline BAF was based on a predicted BCF and a FCM.

[b] This is the geometric mean of measured baseline BAFs for sculpin and alewives, both of which are trophic level 3.

[c] Cook, P.M., 1995 Memorandum to C.E. Stephan. March 7.

[d] This is based on the concentrations of dieldrin in sediment and fish. However, the concentration in fish is probably partially due to exposure of the fish to aldrin, which is converted to dieldrin. This BAF is probably not appropriate where there is more or less aldrin.

[e] This baseline BAF for trophic level 3 was calculated by using the following equation:

$$BAF_{TL3} = \frac{FCM_{TL3}}{(BAF_{TL4})(FCM_{TL4})}$$

where:

BAF_{TL3} = Baseline BAF for trophic level 3
BAF_{TL4} = Baseline BAF for trophic level 4
FCM_{TL3} = Food-Chain Multiplier for trophic level 3
FCM_{TL4} = Food-Chain Multiplier for trophic level 4

These values needed for this calculation are given in Appendix G of the Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine BAFs. EPA-820-B-95-005, March 1995.

Table F-2: Log K_{ow} Values for BCCs[1]

aldrin[2]	6.5
chlordane	6.0
DDT	6.45
dieldrin	5.2
endrin[2]	5.06
PCBs	6.589
toxaphene	5.33
dioxin	7.2
hexachlorobenzene	5.6

[1]Source of values, except where otherwise indicated, is the Great Lakes Water Quality Initiative Technical Support Document for the Procedure to Determine Bioaccumulation Factors (DPA-820-B-95-005

[2]Source: Internal USEPA Report on Summary of Measured, Calculated and Recommended Log K_{ow} Values, April 10, 1995

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Public Hearing Transcript
and List of Attendees

August 1, 1997

ENVIRONMENTAL QUALITY BOARD

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

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

August 1, 1997

Ms. Judy Cooper
Director, Administrative Law Division
Office of the Secretary of State
Capitol Complex
Charleston, West Virginia 25305

RE: 46CSR1 - Requirements Governing Water Quality Standards

Dear Ms. Cooper:

At this time, the transcript from the Public Hearing held on July 21, 1997 at 7:00 p.m. has not been completed by the court reporter. Upon receipt of this transcript, we will forward the necessary copies to your office as well as the Legislative Rule-Making Review Committee. Oral comments will also be documented in the transcript.

If you should have any questions, please feel free to contact Libby Chatfield at 558-4002.

Sincerely,

Ann L. Holstein
Administrative Secretary

ENVIRONMENTAL QUALITY BOARD MEETING
JULY 24, 1997 - 3:00 P.M.
ATTENDANCE ONLY

1. Richard Ford Allegheny Power 412 838 6813
2. Mark Vignovic Weirton Steel Corporation 304 797 4276
3. Bob Williams Virginia Power 804 273 2994
4. Jessica Kelley Caldwell & McCormick/ACT Foundation
5. David M Flannery Jackson & Kelly
6. Christa M. Stewart WSAZ-TV (304) 344-3521
7. Ben Greene WVMRA 346-5318
8. Leonard Knee Bowles Rice 347-1106
9. Jennie Henthorn Bowles Rice 347-1162
10. Dave Yaussy Robinson & McElwee 347-8308
11. Jim Eychaner USGS 347-5130
12. Randy Lovic OWR 558-3614
13. Scott D Goldman DEP-OLS 8-9160
14. Don Kuntz Bureau for Public Health 558-2961
15.
16.
17.
18.
19.

ENVIRONMENTAL QUALITY BOARD MEETING
JULY 24, 1997 - 3:00 P.M.
ATTENDANCE ONLY

1. DAVE WATKINS - OWR / DEP
2. Don Kuntz - Environmental Health
3.
4.
5.
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Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Copies of Comments Received

August 1, 1997

WEST VIRGINIA RIVERS COALITION

21 July 1997

Environmental Quality Board
1615 Washington Street East
Suite 301
Charleston, WV 25311-2126

Re: Triennial Review of State Water Quality Standards

Dear Environmental Quality Board Members,

The West Virginia Rivers Coalition is a non-profit organization who's mission is the "conservation and restoration of West Virginia's exceptional rivers and streams." Our organization has 43 affiliate member groups and approximately 2300 individual members.

We would like to submit the following comments in regards to the triennial review of state water quality standards. We would also like to go on record in support of the comments submitted by our affiliate groups: Cindy Rank of the West Virginia Highlands Conservancy, Dr. Margaret Janes of the Potomac Headwaters Resource Alliance, and Charles H. Merritt of the West Virginia Environmental Council (Highlands Region).

The West Virginia Rivers Coalition was pleased to see and strongly supports your proposed modification of the fecal coliform standard as defined in Section 8.12 of the proposed standards. We also support the non-point source definition as stated in Section 2.12.

WVRC believes the fecal coliform standard clarification will be helpful given the increase in bacterial contaminated waters within our state and the associated health problems and threats. The clarification will also provide consistency with the fecal coliform standard of the U.S. Environmental Protection Agency.

Transmission of disease through water contact and/or drinking water is posing a greater and greater health risk each day. There continues to be an increasing number of repeated outbreaks of human illness due to contaminated water - both via drinking and recreational use. (eg. Giardia, Cryptosporidium, Salmonella, Camplobacter, and E. coli 0157).

We know that exposure to fecal contaminated water supplies - either by swimming, fishing, boating or drinking - makes people sick, in some cases severely.

We know that we have a problem here in West Virginia with extremely contaminated waters that a number of towns/cities use as their primary water supply. These waters are also populated by a high number of recreational users. (Please see the attached USGS Water Quality Data showing a statistical summary of fecal - indicator bacterial concentrations at selected stream-sampling sites in the South Branch Potomac River and Lost River Basins in West Virginia from March 1994 to August 1995. Alarmingly, one test reported 220,000 colonies per 100 mL. In fact, one-third of the sites tested in this study were above current standards).

We also know that other organisms - including livestock - are also susceptible to, and sustain negative consequences from bacteria-contaminated water supplies. (Studies of livestock show increased illness and infection, and decreased weight gain due to exposure to contaminated water.)

The West Virginia Rivers Coalition believes it vital to adjust the fecal coliform standard to protect our public drinking water supplies and to protect our ability to continue to enjoy and be safe while recreating in and along our state's exceptional rivers.

Thank you for the opportunity to provide comments.

Sincerely,

Pamela C. Moe-Merritt

Pamela C. Moe-Merritt
Conservation Program Director

from the Potomac Headwaters Land Treatment Watershed Project Environmental Assessment June 1996

Table 3. Statistical summary of fecal-indicator bacteria concentrations at selected stream-sampling sites in the South Branch Potomac River and Lost River Basins, West Virginia, March 1994-August 1995

[ml, milliliter; N, number of samples; Min, minimum; Med, median; Max, maximum. Percent > 200 is the percentage of samples in which fecal coliform bacteria concentrations exceeded 200 colonies per 100 milliliters; <, less than. Median ratio is the median of the ratios of fecal coliform bacteria concentrations to fecal streptococci bacteria concentrations]

		Fecal coliform bacteria, in colonies per 100 mL				Fecal streptococci bacteria, in colonies per 100 mL			
Site	N	Min	Med	Max	Percent > 200	Min	Med	Max	Median ratio
1	12	5	18	540	8.3	12	150	2,900	0.2
2	18	6	91	2,000	27.8	18	360	11,000	.3
3	19	1	5	87	.0	7	160	2,000	.0
4	12	2	56	550	25.0	11	255	1,000	.3
5	12	1	45	130	0.0	26	195	2,000	.2
6	12	13	71	520	16.7	16	350	8,500	.2
7	12	5	58	140	.0	27	220	1,800	.3
8	18	12	145	3,400	33.3	43	890	2,400	.3
9	19	2	110	1,200	36.8	27	980	3,600	.2
10	12	1	49	290	16.7	8	140	1,100	.2
11	11	20	73	530	18.2	50	730	3,900	.3
12	19	2	83	590	15.8	6	680	2,200	.2
13	19	18	570	220,000	73.7	38	940	95,000	.9
14	18	15	305	4,500	55.6	62	795	8,800	.4
15	10	18	67	460	30.0	31	240	810	.5
16	18	38	495	16,000	66.7	25	680	6,000	1.0
17	11	5	140	340	18.2	11	140	1,600	.5
18	11	4	30	350	9.1	18	76	540	.3
19	18	100	580	31,000	83.3	140	1,100	84,000	.8
20	7	26	73	1,000	28.6	130	990	4,800	.1
21	7	150	1,100	2,600	85.7	200	720	1,500	1.7
22	7	48	300	650	57.1	88	570	1,700	.5
23	7	16	75	480	28.6	77	1,300	2,000	.3

fecal coliform (max) range
87 - 220,000

fecal strep (max) range
540 - 95,000

FROM

PAM MOE-MERRITT
CONSERVATION PROGRAM DIRECTOR

WEST VIRGINIA
RIVERS COALITION

HEADQUARTERS
P.O. BOX 578
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PHONE [redacted]

TO

Environmental
Quality Board
304. 558. ~~2196~~ 4116

SENT BY Pam

ATTENTION: Libby Chatfield

NO. PAGES (INCLUDING COVER)

MESSAGE:

7-23-97

Libby -
To follow are written comments similar to our testimony on Monday evening.
Thanks!
Pam
4 pages Total

Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, Virginia 23060

VIRGINIA POWER

July 23, 1997

Ms. Margaret Chico-Eddy, Clerk
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311-2126

Re: **46 CSR 1 - "Requirements Governing Water Quality Standards"**

Dear Ms. Chico-Eddy:

Enclosed are the comments of Virginia Electric and Power Company ("Virginia Power") with respect to the proposed amendments to West Virginia's water quality standards that have been advanced by the Environmental Quality Board. I would appreciate your placing these comments into the record of this rulemaking proceeding.

Virginia Power is the owner and operator of the Mount Storm Power Station, the largest coal-fired generating station in the Virginia Power system. Mount Storm is located in Grant County, West Virginia and is served by Mount Storm Lake.

Since November 20, 1975, Mount Storm has been subject to a mixing zone and site-specific water quality standard related to thermal aspects of the discharge from the station. We are very concerned about the proposals which have been advanced by the Board to modify §7.2.d.6.1 in ways which significantly restrict these long time regulatory requirements and jeopardize the compliance status of this facility.

In our detailed comments attached to this letter, we have reviewed the extraordinary success that we have had in improving the water quality of the lake and the Stony River, the receiving stream associated with Mount Storm. We have also pointed out that the new NPDES permit, which is prepared for immediate issuance, will allow us to conduct a demonstration in support of alternative effluent limitations for our thermal discharge, which, if approved, will satisfy all mixing zone and water quality standard requirements of the Board's regulations without the need for the site-specific conditions contained in §7.2.d.6.1.

Unfortunately, it will take several months to complete this demonstration after we obtain the approvals of EPA and DEP for the study protocols. It is therefore necessary for the provisions of this section to continue in effect unchanged pending completion of this demonstration and obtaining the necessary regulatory approvals for an alternative effluent limitation. Moreover, should such a demonstration not result in the approval of alternative effluent limitations, it will be necessary for Virginia Power to request the Board to continue

the site-specific provisions of this section in effect subject to whatever rejustification requirements the Board may wish to establish.

Accordingly, we urge the Board not to change the provisions of §7.2.d.6.1 and instead, to allow the current provisions of that section to continue in full force and effect subject only to a provision that would recognize that upon the successful completion of a 316(a) study and alternative effluent limitations that such a section would no longer be necessary.

Virginia Power greatly appreciates the opportunity to provide the Board with comments on this important matter. Should you have any questions regarding these matters, please do not hesitate to contact me at (804) 273-3023.

Very truly yours,

Pamela Haggert

for A. Wallace Hadder
Manager, Environmental Policy & Compliance

AWH/vlr

cc w/attachment: Mr. Randy Sovic
Division of Environmental Protection
1201 Greenbrier Street
Charleston, WV 25311-1088

Mr. Dwight McClure
Division of Environmental Protection
1201 Greenbrier Street
Charleston, WV 25311-1088

Ms. Carol Ann Davis
U. S. Environmental Protection Agency
841 Chestnut Building
Philadephia, PA 19107

July 23, 1997

COMMENTS OF VIRGINIA ELECTRIC AND POWER COMPANY TO THE WEST VIRGINIA ENVIRONMENTAL QUALITY BOARD WITH RESPECT TO PROPOSED AMENDMENTS TO 46 CSR 1 - "REQUIREMENTS GOVERNING WATER QUALITY STANDARDS"

On June 18, 1997, the Environmental Quality Board ["Board"] filed with the Secretary of State a series of proposed amendments to 46 CSR 1 - "Requirements Governing Water Quality Standards." As a part of that filing, the Board also provided notice that oral comments could be made with respect to these proposals at a public hearing held at 7:00 p.m. on July 21, 1997 and that written comments may be submitted be by the close of business on July 23, 1997. Virginia Electric and Power Company ["Virginia Power"] is pleased to have the opportunity to comment on these significant proposals.

I. GENERAL COMMENTS

The proposed amendments that have been advanced by the Board relate to a wide variety of changes to West Virginia's water quality standards. These include changes to a number of the general water quality standards and related requirements, as well as deletions and revisions to variances and site-specific numerical criteria set forth in §7.2.d. of the rule. One of the proposed amendments to §7.2.d. directly affects the Stony River in Grant County, the receiving stream associated with the Mount Storm Power Station ["Mount Storm"]. Virginia Power recognizes that detailed and comprehensive comments with respect to these regulations have been filed with the Board by the West Virginia

Chamber of Commerce. Virginia Power endorses those comments. The remainder of these comments will focus on the specific proposals of the Board to amend §7.2.d.6.1. as well as some additional comments on the aspects of the proposed rule.

II. STONY RIVER MIXING ZONE AND SITE-SPECIFIC NUMERIC CRITERIA

The Mount Storm Power Station is located in Grant County, West Virginia. The facility is serviced by Mount Storm Lake, an industrial impoundment that provides cooling water and cooling for thermal discharges that is critical for station operations. A site-specific thermal mixing zone was originally established by the former Water Resources Board in 1975. Under the terms of that order, a mixing zone was established from the discharge from Mount Storm Lake to a point approximately 1.6 miles below the discharge from Mount Storm Lake. A site-specific numeric water quality criterion for temperature is then established in the regulations of the Board from the edge of the lower limit of the mixing zone through the entire remaining length of Stony River to its confluence with the North Branch of the Potomac River. Specifically, the provisions contained in the Environmental Quality Board regulations that are applicable to Mount Storm are as follows:

> 7.2.d.6.1. Except that the Stony River downstream from the limit of the thermal mixing zone (as described by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to its confluence with the North Branch of the Potomac River is exempt from the 5° F above natural temperature rise; however, the maximum temperature outside the mixing zone shall not exceed 87° F at any time during the months of May through November and not exceed 73° F at any time during the months of December through April.

A. THE CURRENT MIXING ZONE AND SITE-SPECIFIC NUMERIC CRITERIA FOR STONY RIVER IS WELL JUSTIFIED IN LAW AND FACT

The mixing zone and site-specific numeric criteria applicable to Stony River and the

discharge from the Mount Storm Lake have been in effect for more than 20 years. Those requirements have not only been approved repeatedly by the Board and its predecessor, the Water Resources Board but also by EPA. During this period numerous environmental investigations and studies have been performed in the Stony River by the Division of Natural Resources and Virginia Power. Much of Virginia Power's work in the area has been in voluntary partnership with the agency. It would be hard to imagine any stream that has been more closely examined from an environmental and thermal perspective than the portion of the Stony River that is the subject of the mixing zone and site-specific numeric criteria that are referred to in §7.2.d.6.1.

The merit of the mixing zone approved by the Water Resources Board in 1975 continues to exist to this date, even when viewed in light of the Board's modern day regulatory requirements with respect to mixing zones. There has been some question raised as to whether the provisions of §5.2.h.4. may create a concern when applied to the circumstances at Stony River. That provision indicates that a mixing zone would not be appropriate "where instream wastes concentration of a discharge is greater than 80%." The data available to Virginia Power do not indicate any concern with respect to this provision whatsoever even though the discharge from the Mount Storm Lake makes up virtually all of the discharge into Stony River at the point immediately below the Mount Storm Lake. This is because the vast majority of the heat which is present in that discharge is naturally occurring and is not the result of the industrial operations related to Mount Storm.

In any case, the mixing zone provisions of Section 5 of the Board's rule are not applicable to this segment of the Stony River inasmuch as a site-specific mixing zone is

established under the provisions of §7.2.d.6.1. It has been suggested by EPA (and is implicit in the Board's proposal) that it is necessary to modify the site-specific provisions related to Stony River in order to mandate the performance of a 316(a) demonstration and alternative effluent limitation. Virginia Power does not believe this is a correct interpretation of the Board's regulations. Section 5.2.i of the Board's regulations indicates that a successful demonstration under §316(a) "shall constitute compliance with all provisions of this section." Moreover, it is important to note that the Board's rules allow for the establishment of mixing zones similar to the one at issue here (§6.1.5), of new criteria (§6.5), and of revised criteria (§6.3).

Accordingly, we do not interpret the Board's rules as mandating a §316(a) study, but rather recognizing that if a §316(a) study is performed, mixing zone requirements would otherwise be satisfied. Given the high quality nature of this stream and the absence of any regulatory requirement mandating the performance of a §316(a) demonstration, we believe that it is both factually and legally appropriate for the existing provisions of this regulation to continue in full force and effect.

B. IF A §316(a) DEMONSTRATION AND REQUEST FOR ALTERNATIVE EFFLUENT LIMITATIONS IS TO BE UNDERTAKEN AT ALL, IT SHOULD BE PURSUED IN THE CONTEXT OF THE MOUNT STORM NPDES PERMIT AND NOT IN CHANGES TO WATER QUALITY REGULATIONS

Virginia Power is concerned about the Board's proposal to address issues associated with §316(a) and the context of a change to the water quality regulations of the State. 47 CSR §10-10.2.a. provides that the Chief, with the concurrence of EPA, is empowered to grant variances under §316(a) of the federal Clean Water Act for thermal pollution. A §316(a) variance is available to any source of thermal discharge and may

result in limitations on heat that are in the alternative to limitations that would otherwise be required by effluent guidelines, new source performance standards and water quality standards. Successful completion of a §316(a) demonstration and establishment of alternative thermal effluent limitations less stringent than those that would otherwise be required by water quality standards or technology based limitations, requires only that a source show that the less stringent limitation nevertheless will assure maintenance of a "balanced, indigenous population" of shellfish, fish and wildlife in the water body to which the thermal discharge is made. Accordingly, under the regulatory regime that is already in place, a successful §316(a) demonstration to the Chief and EPA will automatically satisfy both mixing zone and water quality standard requirements of the Board.

As an alternative to addressing §316(a) issues in the Board's regulation, Virginia Power favors addressing this issue in the context of the reissuance of the NPDES permit for Mount Storm which is currently in progress. Virginia Power has received the formal draft NPDES permit from the DEP and anticipates that a reissued NPDES permit for Mount Storm will occur in the immediate future. Virginia Power is proposing here the inclusion of a special permit condition in the reissued Mount Storm NPDES permit, which calls for the performance of a §316(a) demonstration. This special condition, which must be approved by EPA as part of their permit review process, provides that historical information coupled with confirmatory samples collected under worse case conditions (i. e., discharge spargers will be off) be assessed and complied into a Low Potential Impact Type III 316(a) Demonstration report. Attached is a copy of the special condition that Virginia Power has requested DEP to impose in the reissued Mount Storm permit.

Under the terms of the special permit condition, once EPA and DEP have made a determination with respect to the §316(a) demonstration and request for alternative effluent limitation, Virginia Power will advise the Board, thus allowing the Board to take whatever action may be appropriate with respect to the terms and provisions of §7.2.d.6. Should a §316(a) demonstration and an appropriate alternative effluent limitation be approved, it may well be appropriate to eliminate altogether the provisions of §7.2.d.6.1. Should, however, the §316(a) demonstration not be approved, or an alternative limitation established, that does not reasonably accommodate current operations at Mount Storm, it will be necessary for the provisions of §7.2.d.6.1. to continue in effect subject to whatever rejustification requirements the Board may impose.

Time limitations alone preclude addressing this issue in the context of the Board's current rulemaking. Even though the Board received EPA's objection to this and other site-specific criteria in November, 1995, Virginia Power was not informed of EPA's concerns until early 1997. It was sometime later that Virginia Power was first advised of the interest of the Board and EPA in having a §316(a) demonstration undertaken by Virginia Power. While Virginia Power has worked diligently with the Board's staff and DEP on these issues since they first arose, time has not allowed the parameters and protocol of the §316(a) issues to be fully resolved. However, preliminary agreement on the study plan protocol has been reached with the DEP and the study plan has been forwarded to EPA for review.

By deferring to the NPDES process, the Board can be assured that §316(a) issues will be addressed in a timely manner without the need to change the current provisions of §7.2.d.6.1.

C. THE SPECIFIC PROPOSALS CURRENTLY BEING ADVANCED BY THE BOARD ARE FLAWED

Two aspects of the proposals that have been advanced by the Board to change the site-specific provisions related to Stony River are problematic to Virginia Power. The first relates to the provision to limit the reach of the mixing zone that had been approved by the Board on November 20, 1975 and the second relates to the establishment of a fixed date by which the site-specific mixing zone and numeric criteria would continue to be effective.

Virginia Power believes it to be inappropriate to limit the length of the mixing zone that was approved by the Board on November 20, 1975. Given the fact that the point of these proposals is to require a §316(a) demonstration to be performed, we believe that the existing mixing zone and portion of the river covered by the site-specific exception should continue through its full approved length, subject to being fully examined within the scope of the §316(a) study. The Board's own regulations provide that upon satisfaction of §316(a) requirements, all of the mixing zone requirements of the Board would be fully satisfied (see §5.2.i).

While Virginia Power initially proposed to limit the length of the mixing zone that had been earlier approved, this offer was made in the context of continuing in effect the existing mixing zone and site-specific numeric criteria. Because the §316(a) demonstration will allow a full examination of factors that would satisfy the Board's mixing zone requirements, we believe it would be inappropriate to prematurely limit the scope of the mixing zone issues at this time. Additionally, it is commonplace for environmental regulatory agencies to stay existing requirements or suspend applicable permit limitations during the pendency of a 316(a) demonstration. For example, Virginia Power is currently performing a 316(a)

demonstration at a coal-fired power station in Virginia and, as a special condition of the NPDES permit, the agency waived the applicable thermal limitation in the permit and suspended the temperature standard required for areas outside the approved mixing zone during the pendency of the demonstration. This special condition was approved by EPA. Virginia Power strongly feels that existing permit conditions and the site-specific exception should remain in place without change during the demonstration.

Likewise, Virginia Power believes it is inappropriate to establish an outside date of the effectiveness of the site-specific mixing zone and numeric criteria set forth in §7.2.d.6.1. We assume the Board's proposal inadvertently provided for the date of May 30, 1997 as the cut-off for the effectiveness of this provision, since that date has already expired. Our concern, however, is much broader, and goes to the question of whether there should be any date established at all. While Virginia Power is certainly prepared to submit a timely demonstration in the near term, it has no control over the approval of the protocol for that demonstration or outside events that could delay or impact the study (e.g., river flood conditions or land owner who uncooperatively deny access for Virginia Power biologists to the river sampling locations), nor does it have control over the date by which the demonstration, once submitted, would be deemed approved or disapproved by the appropriate regulatory authorities. As set forth at 47 CSR §10-10.2.a., an approval would not only be need to be made by the Chief, but also by EPA. If, for whatever reason, successful approval of the demonstration does not occur by the May 30, 1998 deadline, the mixing zone and site-specific exception will end and the operation of Mount Storm Power Station is imperiled. Continued operation of the station at current levels would require Virginia Power to likely violate the State Water Quality Standard for temperature

and this we cannot do. Utilizing an an Administrative Order to excuse such violations provides no comfort to Virginia Power since we would remain exposed to third party litigation or liability, possibly even from EPA. Virginia Power believes there is no regulatory or environmental benefit for imposition of a "sunset" provision for the existing exception under the proposal advanced herein for performance of a 316(a) demonstration as a special condition of the power station's NPDES Permit.

In any case, it will take several months to complete a successful §316(a) demonstration even by relying heavily on data which has already been generated by Virginia Power and others with respect to Stony River. Under the proposal that Virginia Power has advanced to DEP, a demonstration utilizing existing data with one round of confirmatory sampling to be performed in September, 1997 would require nine (9) months from the date of the approval of the demonstration protocol by DEP and EPA. Moreover, should a §316(a) demonstration not be approved by DEP and EPA, it will be necessary for the provisions of §7.2.d.6.1. to continue in effect indefinitely subject to whatever rejustification requirements the Board may impose.

Accordingly, should the Board elect to have a provision included in its rule to address §316(a) requirements (and Virginia Power urges that it not do so), the appropriate provision that should be included in the rule would be as follows:

> 7.2.d.6.1. Except that the Stony River downstream from the limit of the thermal mixing zone (as described by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to its confluence with the North Branch of the Potomac River is exempt from the 5° F above natural temperature rise; however, the maximum temperature outside the mixing zone shall not exceed 87° F at any time during the months of May through November and not exceed 73° F at any time during the months of December through April. <u>This exception shall</u>

apply until the successful completion of a study conducted pursuant to Section 316(a) of the federal Clean Water Act.

D. THE RECEIVING STREAM ASSOCIATED WITH MOUNT STORM POWER STATION IS IN EXCELLENT CONDITION AND HAS GREATLY BENEFITTED FROM THE DISCHARGE FROM MOUNT STORM LAKE

There can be no denying the extraordinary improvements have been made in the quality of Stony River over the years as a result of the efforts of Virginia Power. It is important to note that Virginia Power began working cooperatively with state agencies and USEPA in the late 1970's to voluntarily add lime to Mount Storm Lake to buffer acid mine runoff from upstream sources. The result has been a significant restoration of a fishery that had previously been destroyed by acid conditions. This over-liming continues to date and has had a beneficial effect upon the health of the lake and Stony River below the lake. Several years ago, the Division of Natural Resources urged Virginia Power to initiate a lake fertilization program to enhance the lake's plankton community and in turn the sport fishery. Using consultants from West Virginia University and Ohio State University as well as guidance from the DNR, this successful program continues. Today, the lake enjoys the reputation of being an important recreational resource.

With respect to temperature related issues, the Mount Storm NPDES permit has for many years carried with it requirements to demonstrate the effectiveness of the thermal mixing zone in Stony River. The results of these demonstrations have been submitted to DEP each year showing conformance with the water quality standards at the end of the mixing zone.

Macroinvertebrate studies were performed by Virginia Power biologists in Stony River for a six year period ending in 1990. The studies have been submitted to DEP and

established that the benthic macroinvertebrate community at the monitoring station nearest the discharge from Mount Storm lake contains an assemblage of aquatic insects indicative of a healthy system. Annual macrobenthic surveys at this monitoring station continue to date. Lake management studies were begun in 1984 in Mount Storm Lake in cooperation with state agencies and continue to date. These studies have included additional monitoring and investigations in the Stony River and spawn further cooperative efforts with state agencies in the lake and river. A significant body of information has been collected on water quality and macrobenthic and fish populations in the Stony River.

We note that the 1996 West Virginia §303(d) Stream List, identifies Stony River as being adversely impacted by mine drainage, particularly with respect to metals, pH and unionized ammonia. There is nothing in this listing which implicates in any way any of these water quality problems with the discharge from Mount Storm generally or thermal effects more specifically. In fact, without Virginia Power's voluntary over-liming program in Mount Storm Lake and the corresponding discharge of neutralized water, the ability of the Stony River to meet some of its designated uses would not be possible.

III. CONCLUSION

Accordingly, Virginia Power urges the Board not to revise the provisions of §7.2.d.6.1. and instead to allow issues related to the exception and §316(a) to be resolved through the NPDES permitting process.

Virginia Power thanks the Board for the opportunity to file these comments and looks forward to successful resolution of the issues.

Respectfully submitted this 23rd day of July, 1997.

for Pamela F. Faggert
A. Wallace Hadder
Manager, Environmental Policy & Compliance

Of Counsel:
David M. Flannery
Jackson & Kelly
1600 Laidley Tower
Post Office Box 553
Charleston, West Virginia 25322
Telephone: (304) 340-1017
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E-mail: dmflannery@jacksonkelly.com

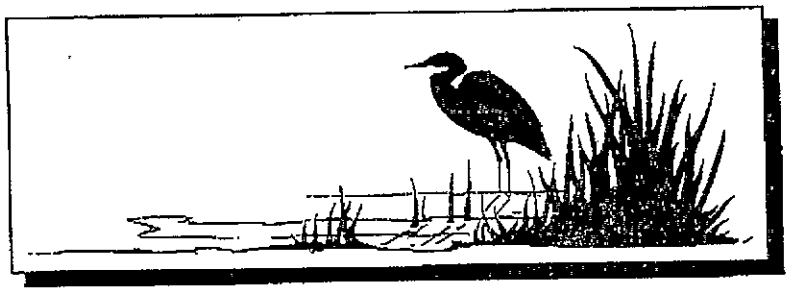
MOUNT STORM NPDES PERMIT NO. WV0005525
PROPOSED SPECIAL CONDITION

Permittee shall submit to the Chief a demonstration and request for an alternative effluent limitation pursuant to Section 316(a) of the federal Clean Water Act to address the thermal component of the plant discharge. Such a demonstration shall be a "Low Potential Impact Type III Demonstration" as provided in §3.6 of the May 1, 1977 draft EPA Interagency 316(a) Technical Guidance Manual and Guide for Thermal Effects Sections of Nuclear Facilities Environmental Impact Statements. Such a demonstration shall be based upon historical studies and a confirmation study to be performed in September, 1997. In addition to replicating historic physicochemical parameters, the confirmatory study shall also examine benthics at the five historic Virginia Power monitoring stations and fin fish at the four historic DEP electrofishing stations. The confirmation study shall be performed at or near full plant operating conditions with no spargers in operation. A protocol for the performance of the demonstration shall be submitted for approval to the DEP and EPA by the permittee within thirty (30) days of the effective date of the permit. The demonstration shall be submitted to the Chief within two hundred seventy (270) days of approval of that protocol by both the Chief and EPA. Within ninety (90) days of a final decision of the Chief with respect to the demonstration, the permittee shall advise the West Virginia Environmental Quality Board of such action and state how the permittee believes such final decision impacts on the mixing zone and site-specific water quality standard contained in 46 CSR 10-7.2.d.6.1.

VIRGINIA POWER/NORTH CAROLINA POWER
ENVIRONMENTAL POLICY & COMPLIANCE
INNSBROOK TECHNICAL CENTER-1SE
5000 DOMINION BOULEVARD
GLEN ALLEN, VIRGINIA 23060

FAX

OF PAGES, INCL. COVER: 15 FILE: Eqbcom1.wpt
DATE: July 23, 1997



TO: Libby Chatfield
LOCATION: WV Environmental Quality Board
PHONE: 304-558-4002 FAX: 304-558-4116

FROM: Bob Williams (E-Mail: robert_williams@vapower.com)
LOCATION: Environmental Policy & Compliance Department
PHONE: 804-273-2994 VP: 8-730-2994
FAX: 804-273-2964 VP: 8-730-2964

MESSAGE: Libby,

I have attached Virginia Power's comments on the proposed changes to the West Virginia Water Quality Standards which focus upon the Stony River thermal exception. Please accept this fax submittal as our comments. I will attend tomorrow's Board meeting and will bring with me the original signed letter & attachment.

Thanks for accepting these comments via fax transmittal.

Bob Williams

DIVISION OF ENVIRONMENTAL PROTECTION
1201 Greenbrier Street
Charleston, WV 25311-1088

CECIL H. UNDERWOOD
GOVERNOR

JOHN E. CAFFREY
DIRECTOR

July 21, 1997

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

Re: Comments on Exemption from
" 1/2 mile rule"- Weirton Steel

Dear Ms. Chatfield:

Reference is made to Weirton Steel's request for an exemption from requirements of the "1/2 mile rule" (section 7.2.a.B) for discharges from Outlet 002. This letter summarizes the agency's comments related to this matter.

Note that, by a letter, dated June 2, 1997, Mr. Gene Current of Weirton Steel has expressed desire to close the WSC drinking water filtration plant and to purchase drinking water from the City of Weirton (please refer to the attached letter). Therefore, WSC has requested that the compliance deadline for Outlet 002 be extended to June 2, 1999, which would allow WSC and the City of Weirton to study all the aspects of this option. As a part of the permitting process, the agency prefers to give WSC additional time to explore this option and to comply with the applicable provisions of the Clean Water Act for various point sources associated with Outlet 002. Therefore, the agency requests the EQB to deny Weirton Steel's request for an exemption at this time.

As the agency has advised you previously, Weirton Steel has interim limits for Outlet 002. Therefore, WSC does not need an exemption from 1/2 mile rule now. WSC needs to upgrade wastewater treatment system at Outlet 002 before requesting an exemption. WSC does not have any wastewater treatment system at Outlet 002 except two lagoons (with 10 minutes' retention time), which is not BAT treatment system as per WSC.

Please note that the agency does not concur with the the company's contention " The discharge from Outlet 002 is almost entirely once-through non-contact cooling water which is withdrawn from the Ohio River. As such, Outlet 002 is basically discharging water taken from the Ohio River back into the Ohio River", which is misleading. This contention was made to you in their letter dated June 6, 1997.

If you have any questions regarding this matter or if you would like to meet us to discuss this matter, please feel free to call Messrs. Naresh Shah or Randy Sovic of my staff at 304-558-8855 or at our TDD number 304-558-2751.

Sincerely,

OFFICE OF WATER RESOURCES

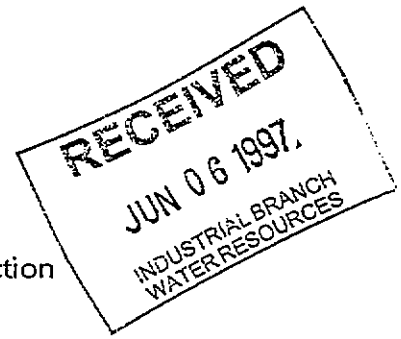
Barbara S. Taylor, Chief

cc: Mr. Jerry L. Ray

WEIRTON
STEEL CORPORATION

Gene P. Current
Director, Environmental Control
(304) 797-2394

CERTIFIED MAIL
June 2, 1997



Ms. Barbara Taylor
Chief, Office of Water Resources
WV Division of Environmental Protection
1201 Greenbrier Street
Charleston, WV 25311-1088

Re: **WV/NPDES Permit No. 0003336**

Dear Ms. Taylor:

I am writing to follow-up on recent discussions you have had with Bill Kiefer, Vice President of Law for Weirton Steel Corporation ("WSC"), and Randy Cox of Spilman, Thomas & Battle. As you know, the Environmental Quality Board ("EQB") recently entered a Consent Order and Agreement (the "Consent Order") resolving WSC's appeal of the above-referenced NPDES permit. The Consent Order is the result of months of negotiations and technical studies by both WSC and the Office of Water Resources, and I know that both of our staffs worked hard to amicably resolve the appeal. As Bill and Randy have explained to you, however, due to recent developments with the City of Weirton, we believe that it is appropriate to modify one of the provisions of the Consent Order.

The Consent Order requires WSC to achieve final limitations[1] for its Outlet 002 discharge into the Ohio River by: (a) June 28, 1998; or (b) June 29, 1999, "if actions are taken which render [the one-half mile rule] inapplicable to Outlet 002 and/or the [WSC drinking water filtration plant] by June 28, 1998. . ." Consent Order, Paragraph 4. At this time, WSC has identified three feasible options[2] to "render" the one-half mile rule inapplicable: (1) relocate the drinking water intake such that it is located upriver from Outlet 002, at a capital cost of approximately $1 million ("Option 1"); (2) work with the EQB and the Legislature to develop some form of legislative exemption for WSC to the one-half mile rule ("Option 2"); or (3) close the WSC drinking water filtration plant and purchase drinking water from the City of Weirton ("Option 3").

WSC prefers Option 3 because of the obvious synergies between WSC and the City. However, the City's existing treatment plant does not have enough capacity to

[1] Other provisions of the Consent Order provide that the "final" limitations are subject to change based on review of a mixing zone study which WSC is to prepare and submit. See e.g., Consent Order Paragraph 2.

[2] Treating the discharge to achieve the limitations is not a feasible option. Two years ago, a consultant for WSC estimated that the cost to achieve the final limitations for both Outlets 002 and 003 was $65 million, ±50%.

service both additional substantial customers, so an upgrade to the plant would be required. At present, although engineers have been retained to do so, the City has not developed a capital cost estimate for an expansion, and, therefore, cannot determine whether it is willing to proceed with the upgrade, or how it would propose to charge WSC for drinking water in light of the upgrade. As Bill and Randy explained to you, it is anticipated that the City will be able to provide this information in the fall of this year.

Although Option 3 is WSC's preferred method of achieving compliance, in the event it is determined that this Option is not feasible, there will not be enough time after making such a determination to implement either Option 1 or 2. Option 2 in particular, which would require WSC to work with the EQB and the Legislature, will need more lead time than what will be available. However, WSC will not attempt to implement either Option 1 or 2 until it determines that Option 3 is not feasible. Thus, WSC requests that it be given until June 29, 1999 to implement either Option 1 or 2 for the purposes of achieving compliance with the limitations. If Option 3 is determined feasible, an extension of time will be necessary to allow for the construction of the upgrade to the City treatment plant and the service piping to WSC. WSC proposes that the WVDEP and WSC arrive at an appropriate completion date for the project on or before June 29, 1999 based upon review of the progress made at that point in time.

If the deadline(s) is not extended, WSC will be required to either expend the $1 million to relocate the intake, or approach the EQB and the Legislature about an exemption, neither of which may be necessary if Option 3 is determined to be feasible. On the other hand, the extension will have no adverse impact on human health or the environment because: (a) the WSC drinking water filtration plant is already meeting the applicable drinking water standards and will continue to do so during the extension; (b) the "final" limitations were developed without the benefit of the Division's mixing zone policy and, therefore, will be undergoing review and likely revision pursuant to the terms of the Consent Order; and (c) the extension would merely maintain the status quo, it would not provide WSC with the opportunity to change the nature of its discharge. Moreover, WSC believes that the extension is appropriate because it would result in Outlet 002 being treated the same as Outlet 003.

WSC therefore requests your consideration and agreement to file a joint motion with the EQB requesting that the Consent Order be modified to extend the compliance deadline for Outlet 002 to June 29, 1999 which would allow WSC and the City of Weirton to further develop the potential for shutting down the WSC drinking water filtration plant and purchasing water from the City.

Very truly yours,

Gene P. Current
Director, Environmental Control

GPC:DMC:eam

c: William R. Kiefer
Dulcie McCutcheon
Mark Vignovic
Donald R. Bluedorn (BCC&Z)
Randy Cox (Spilman, Thomas & Battle)
Mark Scott (WVDEP)

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION III
841 Chestnut Building
Philadelphia, Pennsylvania 19107-4431

July 22, 1997

Dr. Charles Jenkins, Chair
Environmental Quality Board
1615 Washington Street, East
Charleston, WV 25311-2126

Dear Dr. Jenkins:

This letter is the U. S. Environmental Protection Agency's (EPA) written response to the Notice of Public Hearing for modifications to the rule 46 CSR 1, "Requirements Governing Water Quality Standards". A number of changes are being proposed to the State's water quality standards that have been in effect since May 6, 1996, some of which could have a significant impact on water quality in West Virginia. Elizabeth Chatfield has completed a very comprehensive review of the standards and we recognize the significant effort that has gone into addressing the disapproval items and comments from our November 9, 1995 letter.

The enclosure accompanying this letter identifies the revisions that can be made to remove our disapproval of some sections and other modifications and clarification we feel are necessary to meet the requirements of the Clean Water Act (CWA). Also included for your consideration as enclosure 2 is the FY'97-99 National Water Quality Standards Program Priorities. These Program Priorities need to be addressed in order for the State's regulation to be up-to-date with the national goals of the Water Quality Standards Program.

The issues where EPA is particularly concerned include:

- The State's failure to adopt implementation procedures for their anti-degradation policy.
- The site-specific exceptions found at §46-1-7.
- Some of the State's specific water quality criteria that are less stringent than the Federal criteria still need to be supported or modified.

EPA is committed to assisting the Environmental Quality Board in a cooperative effort to resolve outstanding issues and to a prompt review of the standards once they are finalized by the State in accordance with our authority under Section 303(c) of the CWA. When you and your staff have had an opportunity to consider the comments received in the enclosure, we would be pleased to confer with you to resolve the issues. If you have any questions, please contact me at (215)566-5730 or Carol Ann Davis of my staff at (215)566-5738.

Sincerely,

Robert A. Koroncai, Chief
West Virginia/Virginia Branch
Office of Watersheds

Enclosures (2)

Enclosure 1

The Environmental Protection Agency's Comments on West Virginia's Proposed Water Quality Standards Regulations Revisions, 46 CSR 1

§46-1-2 Definitions

The State has indicated that a letter would be provided to clarify the State's definitions for conventional treatment, intermittent streams, natural or naturally occurring, non-point source and wet weather streams. Absent the letter, it was our understanding that modifications would be made to the definitions in the standards regulation but for some, the definitions have not yet been clarified.

Natural/naturally occurring has been modified in this proposal. It is unclear if this would include physical alteration to the surrounding habitat that may affect water quality.

In addition, it was our understanding that definitions for the terms mixing zone, surface impoundment and toxic would be added to the regulation. This has not been done, and we are suggesting that the following definitions be used:

mixing zone: an allocated impact zone contiguous to an effluent discharge where the discharge undergoes initial dilution and where numerical water quality criteria can be exceeded as long as acutely toxic conditions are prevented.

surface impoundment: any above ground structure that can accumulate and hold water.

toxic: any substance or combination of substances including disease-causing agents, which after discharge and upon exposure, ingestion, inhalation, or assimilation into any organism, either directly from the environment or indirectly by ingestion through food chains, may cause death, disease, behavioral abnormalities, cancer, genetic mutations, physiological malfunctions (including malfunctions in reproduction), or physical deformities in such organisms or their offspring.

§46-1-3 Conditions Not Allowable In State Waters

The State should certify that this narrative statement protects sediment quality. In addition, the State should identify or adopt acceptable procedures to implement their narrative water quality and sediment quality criteria for toxic pollutants.

Also, the State should include the following language in this section as 3.2.j.:

Substances in concentrations that produce undesirable aquatic life or result in a dominance of nuisance species.

§46-1-4 Anti-Degradation Policy

From conversations earlier this year, it is our understanding that West Virginia plans to establish a Tier 2.5 for anti-degradation protection. Please confirm our interpretation that Section 4.1.c. is considered Tier 2.5 for anti-degradation protection. Also, this policy is still only conditionally approved, with full approval contingent upon the State's submittal of acceptable anti-degradation implementation procedures. When developing implementation procedures, the State should consider the protection of threatened and endangered species.

§46-1-5 Mixing Zones

West Virginia should modify Section 5.2.d. to read:

Mixing zones, including zones of initial dilution, shall not interfere with fish spawning or nursery areas or fish migration routes; shall not overlap public water supply intakes or bathing area; cause lethality to or preclude the free passage of fish or other aquatic life; not harm any **threatened or** endangered species

Section 5.2.k reads, "Upon implementation of a mixing zone in a permit, the permittee shall provide documentation that demonstrates to the satisfaction of the Chief that the mixing zone is in compliance with the provision outlined in subsection (b).(c).(e) and (h)(B)." The State refers to a subsection (h)(B), but there does not appear to be such a subsection in the Rule.

§46-1-6 Water Use Categories

In Section 6.1 the regulation states that at a minimum, unless otherwise designated by these rules, all waters of the States are designated for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C). We assume that the intention of this section is that such streams will be actually be contained in the subcategory, B1. We recommend that this be specific in the regulation to avoid confusion over which criteria apply to these streams.

§46-1-7 West Virginia Waters

Section 7.2.c.

This still needs some further clarification. Although the state added "Numeric" to describe the water quality standards, we still believe that "standards" should be changed to "criteria". Our rationale for this change is that the use of "standards" can be confusing, since there are other aspects of standards that still need to apply in all these cases, such as antidegradation and narrative criteria. EPA also has additional concerns with the exceptions as follows:

Section 7.2.c.2

This section still needs to clarify the designated use that would be applied to wet weather and intermittent streams. Also, existing uses in wet weather streams still need to be protected. Also, although there may not be measurable flow in a wet weather stream, aquatic life that may exist in pools still needs to be supported.

Finally, it needs to be clarified somewhere in the rule that regardless if a stream is classified as a wet weather or intermittent stream, if a discharge provides sufficient volume of water to support uses, then the water body must be protected for those uses.

Section 7.2.c.3

This section is not necessarily a true statement. EPA developed aquatic life criteria are based on magnitude, duration and frequency. The rationale behind allowing an acute mixing zones is that an organism drifting through centerline of the zone of initial dilution would not be exposed to concentrations exceeding the acute criteria when averaged over the 1-hour averaging period for acute criteria. Therefore, EPA does not believe that this statement is appropriate, since it is our opinion that numeric water quality criteria do apply in the zone of initial dilution. Lethality should not occur to passing and drifting organisms in any portion of the mixing zone.

Section 7.2.c.4

This sections disapproval needs to be addressed. EPA finds that this section appears to establish automatic site-specific criteria equivalent to background concentrations without a demonstration that such criteria are protective of human health and aquatic life, and without offering the opportunity for public review and comment. Federal regulation allows the State a number of alternatives to setting the criteria at ambient concentrations, or "natural conditions". These options include the development of a Total Maximum Daily Load (TMDL) for the water body; development of a site-specific criterion; development of a variance to the applicable standard for a discharger; revisions to the use designation of the stream; or, the permitting authority may make a finding that the return of unaltered intake water pollutant(s) to the same body of water under specified conditions does not have the "reasonable potential" to cause or contribute to an exceedance of the applicable numeric or narrative criterion within the applicable State water quality standard. To remedy this disapproval, we request that West Virginia revise the regulation to reflect one of the above options, or delete Section 7.2.c.4 in its entirety.

Section 7.2.d

This section indicates that the following subsections are approved site-specific criteria, variances and use removals. However, for each exception it is not noted what the exception is based on. This information needs to be included for each exception. For example, if a site-specific criteria is based on a Water Effects Ratio (WER) the use is still being fully protected, but if the exception is based on a socio-economic variance this may not be the case. This will provide

a clearer description of the impact of the site-specific criteria, variance or use removal upon achieving water quality standards in the affected stream segment.

Section 7.2.d.8

This study will support site-specific iron and selenium criteria for the unnamed tributary of Daugherty Run approximately one mile upstream of Daugherty Run's confluence with the Cheat River. It will also support site-specific aluminum and manganese criteria for Fly Ash Run. This completed study has recently been submitted to EPA for review. We reserve the right to comment on this proposal after our review is complete.

Section 7.2.d.16.1 and 7.2.d.20.2

The site-specific criterion for selenium for Conners Run and Little Scary Creek has been reviewed and we have some reservations concerning the value of 62 ug/l because it does not take into consideration bioaccumulation. The national selenium criteria is currently under EPA review due to similar concerns. It is recommended that West Virginia include language in this section that will require this site-specific criterion to be reviewed again in the next triennial review when more information is known about the bioaccumulation effects of selenium on fish and aquatic life.

Section 7.2.d.16.2

The information provided by Weirton Steel appears to present a reasonable argument to grant a variance for Harmon Creek based on socio-economic considerations. However, there are several factors which we believe need to be considered before another variance can be granted to the facility.

First, the engineering and economic reports submitted does not include an alternatives analysis where the company may have considered other, possibly less expensive alternatives. In the study that was done to justify the original variance, Weirton assessed two other alternatives, recycle and discharge to the Ohio River. We realize that the current analysis was completed under short time constraints, but an effluent limitation granted pursuant to a variance needs to represent the level currently achievable by the permittee. In order to make this determination, an analysis of alternatives that could meet standards or provide less water quality degradation is needed.

Second, Weirton Steel is under a consent agreement resulting from a recent enforcement action. We understand that as part of that consent agreement, Weirton Steel is required to upgrade the treatment provided to discharges to Harmon Creek from outfall 004. These improvements are scheduled to be completed by June, 1999, in time for the renewal of the NPDES permit. These improvements will likely impact the quality of effluent that Weirton can achieve which will determine the magnitude of the variance that Weirton needs.

Third, the purpose of variances is that they are supposed to be temporary, used instead of

removal of a stream use where the State believes the standards can ultimately be attained. By maintaining the standard rather than changing it, the State assures that further progress is made in improving water quality and attaining the standards. EPA approval of variances requires that reasonable progress be made toward attaining the water quality standards for the water body as a whole through appropriate conditions. This variance has been in place since 1985, and there is no indication that the facility has made any effort to improve water quality toward the ultimate goal of achieving the standard.

Weirton does not need to have a new variance until the existing permit is renewed in 1999. As noted above, it is uncertain if, or at what level, a variance will be required at that time. Weirton, the State, and EPA should work together during the remaining life of the permit to more carefully determine the level of variance needed upon renewal of the permit, based on the treatment that will be in place at that time and the economically achievable alternatives.

§46-1-8 Specific Water Quality Criteria (*indicates comments that still have not been resolved since EPA's November 9, 1995 letter on the State's August 18, 1995 water quality standards regulation)

The State may want to include the final EPA human health criteria for the following eight parameters:

	Organism only
Acenaphthene	2700 ug/l
2-Chloronaphthalene	4300 ug/l
2-Chlorophenol	400 ug/l
1,2-trans-Dichloroethylene	140000 ug/l
1,2- Dichloropropane	39 ug/l
2,4-Dimethylphenol	1700 ug/l
N-Nitrosodi-n-propylamine	1.4 ug/l
Butyl benzyl phthalate	5200 ug/l.

§8.1 We have noted that West Virginia has deleted the chronic criteria of 87 ug/l for aluminum. Before we could be prepared to approve this modification, West Virginia must provide an acceptable rationale as to why they believe they no longer require a chronic criteria for aluminum and also how the state intends to set limits if a dischargers toxicity is determined to be caused by aluminum at chronic levels.

In the table for aluminum, the State refers to section 7.2.d.B(b), this subsection does not appear to exist in the rule.

§8.6* 130 ug/l is the EPA's lowest observed effect level (LOEL) for acute exposures to beryllium. Therefore, the use of 130 ug/l for chronic exposures is not appropriate. This number should be moved to the acute column, and 5.3 ug/l should be added

to the chronic column.

§8.10* The correct number for chronic exposures to Cyanide is 5.2 ug/l, not 5.0.

§8.11.1* EPA does not believe that a dissolved oxygen level of 4.0 mg/l supports the minimum fishable designation. Please provide a use attainability analysis which supports this criterion.

§8.14* The State should either include criteria for trivalent chromium or provide a rationale for why the State feels that trivalent chromium criteria is not necessary in West Virginia.

§8.15* EPA's aquatic life chronic criterion for iron is 1.0 mg/l. The State should either change their criterion to reflect EPA's number, or provide a rationale for the less stringent number.

§8.17* The use of 1 mg/l of manganese for water supply is less stringent that EPA's criterion. Please provide the rationale for this number, or adopt EPA's recommended criterion.

§8.24 West Virginia has modified the phenolic materials criteria to reflect EPA's recommended criteria for phenols. In order to avoid confusion, we suggest that the parameter be modified to "phenol".

Additional Comments

West Virginia may want to consider adding a trout stocked fishery designated use. The purpose of this use would be to establish specific temperature and dissolved oxygen criteria for those portions of the year when trout are stocked in specific streams.

Enclosure 2

FY 1997 -1999
WATER QUALITY STANDARDS PROGRAM PRIORITIES

- States, Tribes and Regional Offices should resolve all currently outstanding EPA disapproval actions, targeting those posing the greatest legal vulnerability or risk to human health or to the environment. When a State or Tribal disapproval can not be resolved within the triennium, the State or Tribe and Regional Office should develop and agree upon an action plan to collect the data, conduct the analyses, etc. needed to resolve the disapproval action.

- States and Tribes should adopt or identify acceptable procedures to implement their antidegradation and mixing zone policies, and their narrative water quality and sediment quality criteria for toxic pollutants.

- States and Tribes should review and, if necessary, revise their water quality standards to include the protection of threatened or endangered species, identified under the Federal Endangered Species Act (ESA), as part of use designations, criteria, antidegradation policy and implementation procedures, mixing zones policies and implementation procedures adopted to support or implement State or Tribal water quality standards.

- States and Tribes should initiate and continue to expand development of scientifically defensible biologically-based use classification and assessment systems.

- States and Tribes should identify how they will routinely use water quality standards in managing their water quality improvement programs on a watershed basis. Greater recognition of water quality standards as the goals for the watershed may require review and, if appropriate, revision of State and Tribal water quality standards. Such revisions may include more precisely defined, biologically-based, aquatic life uses, as well as more precisely defined recreational uses. More precisely defined uses enhance public understanding of the basis for the uses adopted into State and Tribal water quality standards serving as the goals for the watershed and provide a stronger scientific basis on which to select the most cost-effective management controls.

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Subject:	EPA Comments on WV WQS -		

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COMMENTS: Here they are, let me know if you have any questions.

Carol Ann

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July 23, 1997

VIA HAND DELIVERY

Mr. Charles R. Jenkins
Chairman
Environmental Quality Board
1615 Washington Street, East - Suite 301
Charleston, West Virginia 25311-2126

Dear Chairman Jenkins:

Please find enclosed final comments filed on behalf of the West Virginia Chamber of Commerce to the 1997 Triennial Review of the West Virginia Water Quality Standards.

Specifically, the Chamber is proposing the following actions by the Environmental Quality Board:

1. Expand mixing zone definition to include chemical and temperature mixing zones.

2. Mixing zones for lakes and impoundments should be site-specific.

3. Maintain Category B3 or at a minimum clarify the Category B4 may have various designated uses.

4. Provide relief for Weirton Steel's unique circumstance.

5. Develop a more efficient review process for site specific water quality standards.

6. Modify the proposed definition of "natural" or "naturally occurring" to recognize only point sources and non-point sources for which an owner or operator can be identified.

7. Establish a committee of interested parties to study the use of total recoverable v. dissolved metals.

8. Stay effluent limits in permits based on total recoverable data until the issue of the metals criteria is resolved.

9. Adopt the recommendations of the Fish Body Burden Committee.

10. Expand reference to PQL guidance to include all such guidance issued by EPA.

11. Delay action on revision to the fecal coliform criteria until an appropriate assessment by DEP is completed.

12. Establish an iron water quality standard committee.

13. Clarify the application of the Category A use category to only those water bodies which are actually used as public water supply.

14. Clarify the phenolic materials criteria as phenol criterion.

Very truly yours,

David M. Flannery
Chairman - Environmental Committee
West Virginia Chamber of Commerce

DMF/vlr
Enclosure
cc: Steve Roberts, President
West Virginia Chamber of Commerce

Comments of the
West Virginia Chamber of Commerce
to the Proposed Revisions of
46 CSR 1 - Requirements Governing Water Quality Standards
46 CSR 12 - Requirements Governing Groundwater Standards

INTRODUCTION

The West Virginia Chamber of Commerce (the "Chamber") has as its mission statement the goal of being an action-taking business organization that works for a favorable business climate for its membership and state. The Chamber Environmental Committee has the specific goal of protecting the environment while enhancing the growth of business in West Virginia The West Virginia Chamber works with local chambers of commerce and other associations to improve the environment and the economy of West Virginia by providing business leadership to solve state and regional problems. The West Virginia Chamber of Commerce is the voice of business in West Virginia.

The Environmental Quality Board has announced its Notice of Public Hearing on the proposed changes to 46 CSR 1 and 46 CSR 12 on July 21, 1997 and July 24, 1997. The close of the public comment period will be July 23, 1997. The Board solicited proposals from the public and U.S. EPA for changes to the standards as part of its triennial review to the state water quality standards. Having considered comments received, the Board has now issued its proposed changes.

The following comments are provided to the Board by the Environmental Committee of the Chamber.

COMMENTS

1. Antidegradation Policy (46 CSR 1 §4) Does Not Need Revision

The Chamber supports the Board's decision not to modify the antidegradation provisions of the standards. In its letter of November 9, 1995 EPA praised West Virginia for its Antidegradation Policy and provided conditional approval if the State would develop implementation procedures for the State's policy. As DEP administers the state water quality program it is implementing the State antidegradation regulation and policy. DEP's issuance and review of the NPDES permitting program, as well as its administration of the non-point source regulatory requirements, constitute the effective implementation of the antidegradation policy.

2. Mixing Zones (46 CSR 1 §5)

The Chamber agrees that the deletion of Section 5.2.h.6 is an appropriate editorial change necessary to reflect changes to 46 CSR 1, §7.2.a.2.

Mixing Zone Definition Should be Clarified to Include Thermal and Chemical - In a letter dated November 9, 1995, EPA commented that West Virginia had adopted a Mixing Zone Policy which addressed most of EPA's concerns. West Virginia has developed a mixing zone guidance which reflects a workable mixing zone strategy that is consistent with the Technical Support Document for Water Quality-based Toxics Control and other EPA guidance. EPA requested, however, that the State develop a definition for "mixing zone" and indicate how mixing zones will be sized and located in lakes. The Chamber supports the Board's decision not to modify the definition as prescribed by EPA, based upon the fact that the mixing zone guidance adequately addresses EPA's comment. The Chamber would recommend, however, that Section 5.1 explicitly state that the term "mixing zone" refers to both thermal and chemical mixing zones.

Mixing Zones for Lakes and Impoundment Should Be Site-Specific - According to Section 5.1.f "In lakes and other surface impoundments, the volume of a mixing zone shall not affect in excess of ten (10) percent of the volume of that portion of the receiving water available for mixing." This is a rigid requirement that does not allow for site-specific mixing zone determinations. It does not consider that discharges to lakes or surface impoundments will differ on a site-by-site basis (e.g., different flows or the use of diffusers versus bank discharges), or that the characteristics of lake and impoundments (e.g., water depth or flow-through volume) also vary considerably and may profoundly impact the amount of assimilative capacity at a given site for a particular discharge. The Chamber urges that this section be revised to allow for the development of site-specific mixing zones for discharges to lakes by revising the language of Section 5.2.j to read as follows:

> The Chief may waive the requirements of subsection (e), (f), and (h) above if a discharger provides an acceptable demonstration of . . .

3. Water Use Categories (46 CSR 1, §6)

Attorney General Opinion Unnecessary - The Chamber supports the Board's revision's to the provisions of 46 CSR 1, §6. With regard to EPA's recommendation of an attorney general's statement, minimum criteria applicable to all streams in the state are set forth in both federal and state statutes and the regulations making a statement clarifying those minimum criteria unnecessary.

No Definition of "Other Aquatic Life" Needed - The Chamber supports the Board's conclusion that revision to the definition of "other aquatic life" was unnecessary and that the

water quality criteria provide for the protection and propagation of fish, shellfish, and wildlife.

Implementation of Term "Incidental" Consistent With EPA Guidance - The Board also elected not to clarify the meaning of the terms uses and incidental uses, as was suggested by EPA. The Chamber supports that decision. Historically, the Board considered modifications to Section 6 in 1985, and articulated its philosophy that the occasional use of waters does not establish a justification for the designation of that stream or stream segment for a particular use. The inclusion of this philosophy in the introductory language of Section 6 was designed to be helpful in controversies over appropriate stream use designations. EPA has adopted a similar philosophy in its Water Quality Standards Handbook. "Incidental" is the exact term used in EPA's handbook.

a. Use Categories

List of Regulated Streams Available and is Scheduled for Revision - No Clarification Necessary - EPA provided a comment that Categories B1, B3, and B4 need to be clarified by specifying what waters fall into these categories. The Chamber supports the decision by the Board continue the current water quality standard program with only minor administrative revisions. The fact that a listing of the waters which fall within the use categories B1, B3 and B4 is not available for review does not compromise the ability of the state to adequately protect the state's water quality. Furthermore, the Chamber does not support the diversion of limited funding toward the task of developing a state streams and waters inventory for streams and tributaries that are not of a level of significance to have been included in the "Key to West Virginia Stream Systems and Major Tributaries." Finally, DEP and EPA are currently obligated to address inventorying water quality limited streams as is set forth in the Memorandum Opinion and Order entered by the United District Court for the Southern District of West Virginia on July 9, 1997.

Elimination of Category B3 and Revision to Category B4 Is Not Acceptable - The Chamber objects to the decision of the Board to eliminate category B3, "small, nonfishable streams" set forth under 46 CSR 1 §6.3.c and to modify the description of category B1 streams to incorporate the description of B3 streams. This is not an appropriate revision and is inconsistent with EPA's guidance that recognizes the need to identify various categories of streams based upon multiple uses. In the 1994 Water Quality Standards Handbook EPA recognized that "subcategories of aquatic life uses are an important tool for state agencies in administering water quality standards regulations." The basis for the Chamber's concern is that future decisions of the Board concerning Category B4 streams have the potential for improper application of biocriteria or sediment criteria to the what is currently recognized as Category B3 - small streams, rivers, lakes, and wetlands.

If Modified, Category B4 Must Recognize Multiple Uses - At a minimum, the Chamber urges the Board to recognize that within Category B4 there will need to be various designated uses identified.

4. West Virginia Waters (46 CSR 1, §7)

a. Applicability of Water Quality Standards.

Half Mile Rule Generally Appropriate - In a letter dated July 20, 1995, EPA stated that it would not object to the removal of the state rule which provide a five-mile buffer zone above a public water intake, since there is no analogous Federal rule. EPA did not object to removal of the "five-mile" requirements, provided that water quality standards are met at the drinking water intake.

The Legislative Rulemaking Review Committee approved changes to 46 CSR 1 which became effective on May 6, 1996 which removed the limitation of the use of a mixing zone within five miles above a public water intake. The regulation was modified to include a provision that in assessing the potential human health risks of establishing a mixing zone upstream from a drinking water intake, the Chief shall consider the cumulative effects of multiple discharges and mixing zones on the drinking water intake. The regulation provides that no mixing zone for human health criteria shall be established on a stream which has a seven (7) day, ten (10) year return frequency below 5 cfs. Additionally, revisions were incorporated to provide that water quality criteria for Category A (public drinking water supplies) may not occur within one-half mile of a drinking water intake. All of these conditions reflect a clear concern of the WV Legislature for the protection of water quality uses and therefore should be a sufficient response to EPA' concerns.

Weirton Steel Circumstance Unique and Warrants Approval - The Chamber supports continuation of the provisions of Section 7.2.a.2, but urges proper consideration of the extremely unique circumstance of Weirton Steel Corporation. Weirton Steel's drinking water plant is located less than one-half mile downstream from the company's discharge. The discharge water is non-contact cooling water cycled through one time then returned to the Ohio River. The drinking water plant treats Ohio River water for use as potable water in the Weirton Steel facility. Records indicate that the potable water always has met the applicable drinking water standards. The costs related to movement of the intake represent an expenditure of approximately $1 million. The Chamber urges the Board to consider Wierton Steel Corporation's proposal to exempt its circumstance from the "half mile" rule based upon the fact that the discharge and intake are subject to the same owner/operator and therefore the owner/operator would have no incentive not to meet the applicable requirements.

EPA also offered the comment that it would support West Virginia's prohibition against allowance of mixing zones for bioaccumulative pollutants. (EPA directs the state's

attention to the Final Water Quality Guidance for the Great Lakes System (Fed. Reg. March 23, 1995).

b. Site Specific Exemptions and Water Quality Criteria.

In its letter of November 9, 1995, EPA commented that the State needed to establish the scientifically defensible basis for many of the site-specific exceptions found in 46 CSR 1, §7.

Review Process of Site Specific Water Quality Standards is Inefficient and Burdensome - EPA provided a comment that individual exceptions still need to be reviewed and revised as appropriate. The Board has elected to interpret this recommendation to mean that it must review all site-specific water quality standards in addition to exemption. Accordingly the Board has been engaged in a resource intensive process of reviewing each site specific water quality standard. The Chamber objects to this process and urges a more reasonable review of site specific water quality standards that would rely upon the initial demonstration by the regulated entity unless a change in the use of the stream or criteria were modified. The Chamber urges that development of a more efficient process for such review be adopted.

Wet Weather Stream Exception Appropriate - The Chamber supports the Board's decision not to clarify the language of the exception set forth under what is referenced as Section 7.2.c.2 in the proposed regulation. There has been no confusion or problem identified with the implementation of the language describing wet weather streams or with the implementation of water quality standards upon such streams and revision is not warranted. In addition the exceptions set forth in this section do not apply to the narrative criteria in §3 which serve to protect existing uses and aquatic life.

Exception for Zone of Initial Dilution Support by EPA Proposal - The Chamber supports the Board's decision not to modify the language of Section 7.2.c.3. EPA commented that this exemption was not a true statement and asserted that numeric water quality criteria apply in the zone of initial dilution. EPA's own proposed ruled defines the Zone of Initial Dilution as,

> The region of initial mixing surrounding or adjacent to the end of the outfall pipe or diffusers ports, in which water quality standards do not apply.

56 Fed. Reg. 2825 (January 24, 1991). Accordingly, the comment offered by EPA is unsupported by its own regulatory proposal.

EPA also commented that Section 7.2.c.D, referenced as 7.2.c.4 in the proposed regulation, was also disapproved because it appeared to provide a site-specific exemption

from water quality criteria without providing the opportunity for public review and comment and without demonstrating that such criteria are protective of human health and aquatic life.

Background Conditions Exception Needs Clarified - Section 7.2.c.4 was developed to recognize that there are those instances where background conditions are the cause of the exceedance of a water quality standard. In response to EPA's comments, the Board has proposed to add the phrase, "Provided, that the existing and designated uses of downstream waters are not adversely affected." The Chamber supports this modification, since it was not the intent of the language to allow background conditions to adversely affect existing and designated uses of downstream waters, nor was it intended to create an automatic site-specific criteria equivalent to background concentrations without a demonstration that such criteria are protective of human health and aquatic life, without offering an opportunity for public review.

The Board has also proposed revision to the definition of "natural" or "naturally occurring" as it is set forth under 46 CSR 1 §2.11.b by modifying it to read,

> Those water quality values which exist unaffected by the discharge, or direct or indirect deposit of, any solid, liquid or gaseous substance by any person from any point source or non-point source.

The Chamber urges modification of this revision to provide as follows:

> Those water quality values which exist unaffected by the discharge, or direct or indirect deposit of, any solid, liquid or gaseous substance by any person from any point source or non-point source for which an owner or operator can be identified.

This modification would appropriately recognize the there exist point sources and non-point source discharges for which there is no regulated entity, owner or operator that could affect treatment of the discharge to meet water quality standards. In such circumstances, background conditions become those conditions which exist absent someone upon which to impose the water quality standards.

5. Specific Water Quality Criteria (46 CSR 1, §8)

a. Dissolved Metals Should be the Basis for Metals Criteria.

The Chamber supports the Board's decision to establish a committee of interested parties to study what other states have done concerning the use of total recoverable metals versus dissolved metals as the basis upon which the metal water quality standards will be promulgated and to review carefully EPA's policy concerning measurement based upon the dissolved form. The Board would also charge the committee with the duty to develop appropriate translator factors for use in developing NPDES permits which are required to

have effluent limits reported in total values. The committee would have until March 15, 1998 to provide a recommendation to the Board on the issue. The Chamber would like to express its interest in participating in the Committee and will willingly volunteer its time to assist the Board in its review of this matter.

In the October 1, 1993 memorandum the EPA Office of Water provided that their *Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria* sets forth the policy that "the use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metals." This policy is repeated in Section 3.6 *Policy on Aquatic Life Criteria for Metals* of the EPA's *Water Quality Standards Handbook: Second Edition*, EPA-823-B-94-005a, August 1994, p. 3-34.)

EPA has also provided a comment to the use of dissolved metals criteria its issuance of a stay (60 FR 22228, May 4, 1995) for the National Toxics Rule. One of the primary reasons stated for its action was stated as follows:

> It is not in the public interest to require permitting authorities to establish permit limits based on total recoverable metal ambient water quality criteria which EPA now considers to be more stringent that may now be necessary to protect designated uses. EPA considers staying the metals criteria to be in the public interest as noted above, and therefore good cause exists to issue the stay without notice and comment and to make the stay effective immediately.

A majority of the scientific community supports EPA's conclusion regarding metals bioavailability. In addition, the majority of states with NPDES primacy have also adopted dissolved metals criteria. It is essential that the State water quality program include a method for the accurate determination of the fraction of total metal that is biologically available and toxic in order to effectively implement the NPDES program. In order to translate dissolved criteria into NPDES permit limits, a dissolved to total recoverable correction factor must be used.

The toxicity tests used to develop the majority of the existing total metals criteria were preformed using test solutions in which the ratio of dissolved to total recoverable metal was approximately 1. In the environment this is often not the case, and there may be considerably more total recoverable metal than dissolved metal. In such situations a measurement of total recoverable metal provides an overly conservative estimate of the potential for water column toxicity because it does not accurately reflect the bioavailability of the metal.

To respond to the need to have a translator to account for the amount of total recoverable metal that was present in the toxicity tests used to derive the national aquatic life

criteria for metals, EPA has developed translators that may be applied to existing total recoverable criteria in order to convert the criteria to the dissolved form. These conversion factors may be found in the interim National Toxics Rule of May 4, 1995, at 60 FR 22220.

With regard to the need to consider the accumulation of the metal in the sediments or in aquatic organisms, EPA has developed a detailed discussion of *Dissolved vs. Total Recoverable Metal* on pages 3-34 and 3-35 of their *Water Quality Standards Handbook: Second Edition.* In this discussion the EPA recognizes that "[t]he ambient water quality criteria are neither designed nor intended to protect sediments, or to prevent effects in the food webs containing sediment dwelling organisms." EPA also recognizes that the use of total recoverable standards would be more conservative, if one is considering the risk to sediment and food chain effects. However, the degree of conservatism inherent in the total recoverable approach is unknown because a consideration of sediment impacts is not incorporated into the criteria development methodology. While dissolved metals standards probably provide the best indication of the potential for water column toxicity, total recoverable measurements of the ambient water column may provide an indication of the potential for ecosystem stress, "particularly in locations other than in the water column (e.g., in the sediments.)."

One rationale for not adopting dissolved water quality standards is that the NPDES permit regulation requires the development of total recoverable effluent limitation. Consequently, some form of translator must be used to convert dissolved metals criteria to total recoverable permit limits. EPA has released a detailed guidance on this very issue entitled, *The Metals Translator: Guidance for Calculating A Total Recoverable Permit Limit From A Dissolved Criterion* (EPA 823-B-96-007). This document provides an in-depth discussion of procedures that may be used to determine dissolved to total recoverable translator values and should be consulted by the Committee as it conducts its research and develops its recommendations.

The use of dissolved metals criteria is recommended by EPA, and is clearly in keeping with the criteria development methodology on which the existing aquatic life criteria are based. In addition, the EPA has developed total recoverable to dissolved translators that may be used to convert the existing total recoverable criteria to dissolved criteria, and there is now detailed guidance on how to develop a total recoverable permit limit that will be protective of a dissolved water quality standard.

Total Metals Based Effluent Limits Should be Stayed - Finally, the Chamber urges that due to the controversial nature of this issue and the uncertainty associated with the use of total recoverable metals criteria, the Board stay the inclusion of effluent limits in permits based on total recoverable data until the issue is resolved. The State of Virginia implemented a similar approach with respect to dissolved metals to provide for the appropriate application of the dissolved criteria.

b. Specific Water Quality Criteria

Test Procedure Cross Reference Beneficial - The Board has proposed revision to Section 8.1.a to include a cross reference to Series II, Section 7.2 of these regulations Section 7.3 of 47 CSR 10 - National Pollutant Discharge Elimination System (NPDES) Program. The Chamber supports this revision as providing appropriate clarification and guidance to the regulated community with regard to test procedures.

c. Fish Tissue Body Burden Criteria Should be Replaced By High Volume Samplers

The Board has agreed to accept the final report of the Inter-Agency Committee established to review body burden criteria in the state water quality standards rule. The Board has announced that it will propose deletion of the numeric criteria for fish body burden in favor of alternative procedures that will allow the use of high volume samplers or the calculation of the water quality standard from fish tissue sample.

The Board's actions are in response to EPA's August 6, 1996 letter that questioned whether or not there was an adequate scientific basis for the criteria as set forth in Section 8. EPA also questioned the exposure to significantly higher cancer risk than would be expected from the comparable human health criteria for water and those criteria are not consistent with West Virginia's adopted risk level of 10-6 to protect human health.

The Board Should Continue its Review of the Fish Body Burden Criteria Upon Finalizing its Proposed Revisions - The Chamber supports the Board's decision to replace the fish body burden criteria with the recommendations of the Inter-Agency Committee with regard to high volume samplers and the calculation of water quality standards for fish tissue. The Chamber urges the Board to give careful consideration to the regulatory implications of implementation of the various recommended methods for calculating fish tissue body burden criteria. The Chamber urges that the Board continue its review of the recommendations of the committee with an emphasis upon the methodology for implementation.

d. Practical Laboratory Quantification Level Section Should Be Modified To Include Reference to All EPA Guidance on the Issue.

In its letter of August 6, 1996, EPA raised a concern that Section 8 could be interpreted to allow an "alternative" criteria to be developed in cases where the specified criteria are less than the practical laboratory quantification level (PQL), instream values shall be calculated from discharge concentrations, flow rates and fish body burdens. EPA asserts that altering criteria to suit detection capabilities is not consistent with the requirements that States must adopt those water quality criteria that protect the designated use and those criteria must be based on sound scientific rationale. EPA proposed that the State use an

equation that considers fish species and percent lipid concentration, as well as other factors, to evaluate ambient conditions.

The Board has proposed implementation procedures for parameters with water quality criteria which are lower than the detection limit in Section 8.5. The Chamber urges revision to Section 8.5.d to provide as follows:

> Prior to implementation of any of the procedures outlined herein, a sampling protocol shall be submitted to the Chief for review and approval after consultation with the West Virginia Division of Natural Resources. In developing sampling protocols for any of the methods outlined herein the guidelines in the USEPA document entitled "Guidance for Assessing Chemical Contaminant Data for Use in Fish Advisories, Volume 1, Fish Sampling and Analysis, Second Edition (EPA Document No. EPA 823-R-95-007, September 1997), or such other EPA guidance concerning the assessment of parameters with water quality criteria which are lower than the detection limit shall be used.

6. Appendix E: Criteria Table

Aluminum Revision Appropriate - The Board has proposed deletion of the chronic aluminum criteria of 87 ug/l from Section 8.1. The Chamber supports this deletion based upon the lack of adequate scientific data to support the chronic criterion. The existing acute criterion of 750 ug/l will continue in place to protect aquatic life.

Fecal Coliform Revision Inappropriate - The Board has proposed to revise the provision of Section 8.12 to provide that fecal coliform maximum allowable level shall not exceed 400/100 ml at any time. This revision eliminates the qualification of "in more than ten percent of all samples taken during the month." The Chamber cautions the Board against change to this standard. It is unclear why the change is necessary and how this revision will impact dischargers. It is the understanding of the Chamber that DEP has requested an assessment of this change. The Chamber urges the Board not to adopt this revision unless and until this proposed change is found to be justified and reasonable.

Iron Study Committee is Warranted - The Board has proposed to eliminate Section 8.15.1 which is variance language that had been originally intended for use by the mining industry. The Chamber urges the Board to establish a committee of interested parties to review this criterion to determine whether a variance should be reinstituted. We are informed that the DEP shares our interest in participation in such an iron study committee. The Chamber would like to participate in any such committee and would request that it be notified of its first meeting.

Manganese Revision Appropriate - The Board has proposed the removal of the chronic aquatic life values for manganese in Section 8.17 and the deletion of Section 8.17.1.

The Chamber supports the elimination of the manganese criteria for aquatic life since EPA does not have a comparable criteria. The treatment for manganese often results in more of an adverse environmental impact than the presence of the manganese itself. The Chamber supports the Board's correct decision on this matter.

Application of Category A Should be Clarified - The Chamber, however, urges the Board to consider the proposal that for those NPDES permits issued to mining companies, the manganese criterion for public water supply uses not be applicable, unless there is evidence from the permit application and public review process that particular streams or stream segments do serve as Category A waters. This would allow the discharger to avoid unnecessary application of the human consumption standards. The fact is that mining discharges rarely impact human consumption-use streams. Those streams that do exist are easily discernible by stream surveys as required by the NPDES permit process.

The Board is urged to affirm that Section 6.2 should be applied as written. Only those streams or stream segments that are or become designated as a water supply should be given this use designation. If a stream is not used as a community domestic water supply system, a non-community domestic water supply system (i.e. hospitals, schools, etc.), a private domestic water system; or if it does not have a surface water intake where the water is used for human consumption, then the stream should not have a Category A use designation. The Chamber urges the Board to clarify the purpose of Category A use designations.

Nickel Revision Appropriate - The Board has proposed revision to the chronic nickel criteria for trout waters in Section 8.19 in response to a comment by EPA that the state needed to provide a rationale for the use of 50 ug/l for nickel in trout waters. The Board is proposing that the chronic nickel criteria be based upon a four-day average concentration as established from a specified formula. The Chamber supports this revision as an appropriate refinement to the criterion.

Aldrin, Chloroform, and Tetrachloroethane Revisions Appropriate - The Board has proposed revision to the criteria for aldrin, chloroform, and tetrachlorethane as set forth under Section 8.22. The Chamber supports these revisions as appropriate.

Phenols Criterion Should Be Clarified to Apply to Phenols, Not Phenolic Materials - The Board has proposed revision to the criterion for the phenols as set forth in Section 8.24. The Chamber supports the Board's efforts to respond to the concerns expressed by the regulated community concerning the 5 ug/l criteria and to revise it to reflect the current EPA standard. It was important that West Virginia review this criteria especially in light of the fact that area states to include Pennsylvania and Ohio have much less stringent criteria.

The Chamber proposes, however, that the Board change the regulated parameter from Phenolic Material to Phenol. The Gold Book provides an acute criterion of 10,200 ug/l and a chronic aquatic criterion of 2,560 ug/l, both for Phenol. These values are included in the

proposed Section 8.24 of the proposed aquatic criteria for Phenolic Materials. Other EPA guidance as is set forth under 40 CFR §131.36 which also addresses phenol. In neither case does EPA provide criteria for "phenolic materials."

Chlorine and Zinc Revisions Appropriate - The Board has proposed removal of the total residual chlorine and zinc criteria to accommodate the usage of chlorine and zinc in water treatment plants. The Chamber supports this proposed revision.

7. Groundwater Quality Standards

The Chamber supports the modifications and revisions to the groundwater quality standards.

Respectfully submitted this 23rd day of July, 1997.

David M. Flannery
Chair, Environmental Committee
WV Chamber of Commerce

STATE OF WEST VIRGINIA
DEPARTMENT OF HEALTH AND HUMAN RESOURCES

Cecil H. Underwood
Governor

Joan E. Ohl
Secretary

July 21, 1997

West Virginia Environmental Quality Board
1615 Washington Street, East, Suite 301
Charleston WV 25311-2126

RE: Requirements Covering Water Quality Standards
Amendments to 46 CSR 1

We have reviewed the referenced standards and request that the Board incorporate the following revisions. If adopted, these revisions will further strengthen the public health protection aspect of the standards, particularly as related to public drinking water systems and the renewed federal and state emphasis on protecting source waters and the Watershed Management Initiative recently enacted. Our comments are predicated on the other provisions of the proposed rule remaining substantially intact.

- §46-1-6; under 7.2-B
  Modify the "one-half (½) mile" references to at least "one (1) mile." The present one-half mile limit provides public water systems with limited reaction capability and increased vulnerability to unwanted contaminants.

- Revise the following parameters (allowable concentrations of pollutants in Appendix E - Human Health, Category A):

Antimony	6 μg/l
Cadmium	0.005 mg/l
Nickel	100 μg/l
Lindane	0.0002 mg/l
1,2-dichlorobenzene	0.6 mg/l
1,4-dichlorobenzene	0.075 mg/l
1,1,1-trichloroethane	0.2 mg/l
Toluene	1.0 mg/l
Chlorobenzene	0.1 mg/l
Ethylbenzene	0.7 mg/l
Iron	0.3 mg/l
Manganese	0.05 mg/l

BUREAU FOR PUBLIC HEALTH
Commissioner's Office
Building 3, Room 518, State Capitol Complex
Charleston, West Virginia 25305-0501
Telephone: (304) 558-2971 FAX: (304) 558-1035

The recommended allowable concentrations of pollutants are comparable to current maximum contaminant levels (MCLs) set for public drinking water systems. These MCLs have been established by the federal *Safe Drinking Water Act*.

We appreciate the opportunity to comment on the Board's proposed regulations. Please contact me at 558-2981 if you or your staff wish to discuss further the rationale behind our recommendations.

Sincerely,

Henry G. Taylor, M.D., M.P.H.
Commissioner

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American Electric Power
1 Riverside Plaza
Columbus, OH 43215 2373
614 223 1000

AEP
AMERICAN® ELECTRIC POWER

Mr. Robert Jenkins, Chairman
Environmental Quality Board
1615 Washington Street, East
Suite 301
Charleston, West Virginia 25311-2126

July 15, 1997

RE: Comments on the Triennial Review of 46 CSR 1-- Requirements Governing Water Quality Standards

Dear Mr. Jenkins:

Enclosed are American Electric Power's comments on 46 CSR 1 -- Requirements Governing Water Quality Standards. We appreciate the opportunity to submit these comments before the Board, and we trust that each of them will be given due consideration.

Should you have any questions regarding these comments, please contact me at (614) 223-1233 or Mike Brown at (614) 223-1286.

Sincerely,

Alan R. Wood, P.E.
Manager, Water Quality Section

Enclosure

ARW/JMB

xc: Elizabeth Chatfield, Technical Advisor
Dave Yaussy, Robinson & McElwee
Kathy Beckett, Jackson & Kelly
Randy Sovic, WVDEP,OWR

COMMENTS ON THE TRIENNIAL REVIEW OF 46 CSR 1-- REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

American Electric Power Company
1 Riverside Plaza, Columbus, OH 43215
July 15, 1997

Comment #1: Re-justification of Site-specific numeric aquatic life criteria for Conner Run and Little Scary Creek

American Electric Power has worked closely over the past several months with both the Environmental Quality Board and the EPA to resolve specific issues related to the site-specific numeric criteria and use designations previously derived for Conner Run and Little Scary Creek. This effort included providing information in the form of all previous studies and reports documenting the technical basis for the site-specific criteria, additional and new support information, and a commitment from AEP to voluntarily conduct additional benthic and fish surveys along with biomarker and other studies at Little Scary Creek (see AEP comment package filed June 5, 1997 for additional details).

We trust that this work has satisfactorily addressed the original questions concerning AEP's site-specific numeric aquatic life criteria, and we believe we have provided more than ample supporting documentation necessary to justify the removal of the Category A use, the retention of the site-specific numeric criterion for selenium and iron on Conner Run (Section 7.2.d.16.1), the site-specific numeric criterion for selenium and copper on Little Scary Creek (Section 7.2.d.20.2.), and for the deletion of the site-specific arsenic criterion from both sections. We trust that these issues have been resolved satisfactorily, and we look forward to the Board's consideration of the following additional comments.

Comment #2: Section 6.3.c. - - Request that the Board Retain the existing B3 Use Category

On May 15, 1997 and again on June 5, 1997 AEP submitted comments to the Board supporting the retention of the B3 Use Category within Section 6.3.c. of 46 CSR 1. Within these comments, AEP outlined the purpose and history behind the Board's original adoption of a B3 Use Category, the important role habitat plays in the overall aquatic ecosystem (including attainable uses), and how available habitat, flow conditions and other criteria were essential determinants in designating a stream use. In addition, AEP outlined that multiple use designations are consistent with EPA regulations at 40 CFR Part 131; and that EPA has recognized numerous times throughout its 1994 Water Quality Standards Handbook that **"subcategories of aquatic life uses are an important tool for state agencies in administering water quality standards regulations."** Therefore, AEP urges the Board to change its earlier decision by voting to retain the B3 Use Category.

AEP recognizes that both the Board and the Office of Water Resources are of the opinion that the numeric aquatic life criteria currently recognized under 46 CSR 1 apply equally to B1 and B3 use categories. AEP does not disagree with this current interpretation; however, at some future date the Board will likely undertake the adoption of biocriteria as recommended under Sections 101(a) and 303(c)(2)(B) and/or sediment criteria recommended under Sections 104(n)(1) and 304(a)(1) of the Clean Water Act. At that time, it will likely be critical to have subcategories within use designations (such as a B3 Use Category) to refine and clarify how sediment and/or biocriteria are respectively applied to small streams, rivers, lakes, and wetlands.

Based on the above, AEP believes that it is in the best interest of West Virginia to retain the B3 use category within 46 CSR 1. Otherwise the Board may be restricted in its ability to effectively administer appropriate water quality standards based upon the physical, chemical, biological, socioeconomic and cultural characteristics that are appropriate for protecting West Virginia's diverse water bodies.

Finally, should the Board be unwilling to act on AEP's request, then some action must be taken to amend Section 7.2.d.20.2 of the regulations. This section of the rule, as it is currently written, states that Little Scary Creek "...shall not have Water Use Category A or B1 and shall have Water Use Category B3." If the Board eliminates the B3 Use Category, section 7.2.d.20.2. must be changed to read, "...." **shall not have Water Use Category A and shall have Water Use Category B1**." If the language in this section is not changed, Little Scary Creek will be assigned a use designation that will no longer have regulatory meaning.

Comment #3: Deletion of Chronic Criterion for Aluminum

AEP commends the Board's actions to propose the removal of the chronic criterion for Aluminum. We believe that this was a reasonable decision in light of the serious questions raised by AEP and others regarding the scientific validity of this chronic criterion.

Comment #4: Dissolved Metals Criteria

AEP is disappointed that the Board has not taken action to declare that metals criteria are to be expressed as "dissolved metals" rather than total metals, and it urges the Board to do so during the hearing scheduled for July 21, 1997 or its meeting scheduled for July 24, 1997. Numerous comments have been provided to the Board over the past several years, outlining that the central issue in implementing metals criteria is to accurately determine the fraction of total metal that is biologically available and toxic. EPA has supported the position since 1993 that metals criteria should be expressed in the dissolved form because the dissolved metal more closely approximates the bioavailable fraction of the metal in the water column.

EPA's commitment to the use of dissolved metals criteria is clearly evident in their issuance of a stay (60 FR 22228, May 4, 1995) on the use of total recoverable water quality criteria "in the interest of justice," for all of the National Toxics Rule states. One of the primary reasons listed by EPA in taking this action was that,

> **"It is not in the public interest to require permitting authorities to establish permit limits based on total recoverable metal ambient water quality criteria which EPA now considers to be more stringent than may now be necessary to protect designated uses. EPA considers staying the metals criteria to be in the public interest as noted above, and therefore good cause exists to issue the stay without notice and comment and to make the stay immediately effective." (emphasis added).**

The majority of states with NPDES primacy have also adopted dissolved metals criteria, and we urge the Board to do the same because it is in the "interest of justice," it utilizes sound science, and it would place the regulated community in West Virginia on a level playing field with many of its neighboring states.

Comment #5: Iron aquatic life criterion

As outlined in AEP's previous comments critiquing EPA's antiquated 1976 aquatic life iron criterion, we believe that the national criterion does not satisfy EPA's charge under Section 304(a)(1) of the Clean Water Act requiring it to develop and publish criteria for water accurately reflecting the latest scientific knowledge. We recognize that the Board, in adopting an alternative iron criterion from EPA's recommended criterion of 1.0 mg/l, also shares some concern about the appropriateness of this aquatic life criterion for West Virginia waters. This same concern is also shared by many other states with NPDES primacy as evidenced by their decisions to not adopt EPA's recommended iron aquatic life criterion.

The question now at hand is whether West Virginia's current aquatic life criterion of 1.5 mg/l total iron is adequate, or if it may also be overprotective of aquatic life. AEP believes that this criterion is generally overprotective statewide and clearly overprotective in the major river basins such as the Ohio and Kanawha rivers. This belief is supported by our own field evidence, and by a plethora of ORSANCO and USGS data that show, despite the presence of a large, diverse and healthy aquatic life population, instream concentrations routinely greater than the 1.5 mg/l total iron criterion that typically occur during periods of high flow. As a result we encourage the Board to work with the regulated community (absent any action on EPA's part to revisit its antiquated Red Book iron criterion), in considering the adoption of a more scientifically defensible aquatic life iron criterion reflecting that fraction of total iron that is biologically available and toxic to aquatic life.

Comment #6: Category A Public Water Supplies

The West Virginia Manufacturer's Association recently filed comments outlining that they believe that the Public Water Supply Category A Use is being mistakenly applied to all streams of the state. AEP agrees with these comments and we urge the Board to affirm that that Section 6.2. of the rules should be applied only as they are written. Only those streams or stream segments that are or become designated as a water supply as defined under Section 6.2. of 46 CSR 1, should be given this use designation.

If the stream segment is not used as a community domestic water supply system, a non-community domestic water supply system (i.e. hospitals, schools, etc.), a private domestic water system; or if it does not have a surface water intake where the water is used for human consumption, then the stream should not have a category A use designation.

Implementing the water quality standards in this manner will also be consistent with the intent of the Clean Water Act, and with the way the neighboring states of Ohio, Virginia and Kentucky apply the Public Water Use Category to their Water Quality Standards rules.

Comment #7: Typographical error

Appendix C of 46 CSR 1 provides a listing of Category E-3 Power Production facilities in West Virginia. Within this listing Appalachian Power Company's John E. Amos Plant is erroneously listed within Kanawha County. This facility is actually located within **Putnam** County. AEP asks that this Appendix be corrected to accurately reflect the county in which this facility is located.

Comment #8: Typographical error

Section 6.2.d). of the water quality standards rules refers to, "(... Section 7.2.a.B, for additional requirements for category A waters.)" There is no Section 7.2.a.B. in the rule. This section reference should be changed to Section 7.2.a.**2.**

LEAGUE OF WOMEN VOTERS OF WEST VIRGINIA

6128 GIDEON RD • HUNTINGTON, WV 25705 • TELEPHONE 304-736-3287

July 15, 1997

To: Environmental Quality Board

From: League of Women Voters of WV

Re: Title 46 Series 1, Requirements Governing Water Quality Standards

The League of Women Voters of West Virginia wishes to make some comments on the proposed amendments to the water quality standards.

Our chief concern has to do with 46-1-8.5 "IMPLEMENTATION PROCEDURES FOR PARAMETERS WITH WATER QUALITY CRITERIA WHICH ARE LOWER THAN DETECTION LIMIT" and APPENDIX F. Fish tissue analysis and testing sediments are better measures of the presence or absence of the chemicals than the proposed procedure. We believe the strategy as outlined in the proposal is getting away from direct measurements and will not be sufficient to address water quality problems.

There are difficulties with back-calculating the data on these constituents. Since these compounds are hydrophobic, they are sorbed by fine-grained sediments (clay) and bioaccumulate through the food chain. Back-calculations will not show what was previously in the water. Additionally there is not a steady state of concentrations in water.

In Appendix F, the procedure uses averages which can be misleading and applied to fit the needs of applicants for permits. What data will you use to get an average? How can those averages be applicable to all water bodies? How can you determine a default value for a statewide average? The use of these values is flawed because concentrations of chemicals in fish are not representative of what is in the water. Under the present system there is no attempt to back-calculate. A tremendous amount of data will be necessary to establish this questionable change. We are also concerned about the number of staff members needed to establish the data. Should the taxpayer be burdened with paying for the extra needed resources?

In Table F-1, we wonder if these methods are transferable to West Virginia. Is there enough data available to be defensible statistically?

2.11.b We are pleased that the definition of "naturally occurring" values has been improved.

5.2.h.6 We would prefer better protection of drinking water intakes from mixing zones. We believe the protection should be increased to at least one mile. The 1996 Safe Drinking Water Act clearly asks states to protect source waters for drinking water supplies. We do not believe that 1/2 mile is adequate protection.

6.3.c. CATEGORY BC. We question the advisability of deleting this category. When you destroy small streams, you may not know if there are unique aquatic species there. Was the Non-game Wildlife office consulted about this deletion?

DELETION OF CHRONIC PARAMETERS RELATING TO AQUATIC LIFE FOR MANGANESE AND ALUMINUM. These parameters both have adverse impacts on aquatic life. What evidence is available showing that these should be deleted?

DELETION OF HUMAN HEALTH CRITERIA FOR TOTAL RESIDUAL CHLORINE. We have health concerns about the removal of the parameters for total residual chlorine. What evidence is available on the human health problems from the effects of chlorine in the formation of halomethanes?

In closing we wish to voice our appreciation for the opportunity to make comments on the proposed amendments.

IES/HG

Helen Gibbins

Ellender Stanchina, President

League of Women Voters of WV
2023 Huber Rd.
Charleston, WV 25314

Helen Gibbins, Natural Resources Director
League of Women Voters of WV
6128 Gideon Rd.
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DIVISION OF ENVIRONMENTAL PROTECTION

CECIL H. UNDERWOOD
GOVERNOR

1201 Greenbrier Street
Charleston, WV 25311-1088

JOHN E. CAFFREY
COMMISSIONER

July 10, 1997

Ms. Libby Chatfield
Technical Advisor
Environmental Quality Board
1615 Washington Street, East
Suite #301
Charleston, WV 25311

Re: Section 316(a) Study for Harmon Creek in Vicinity of Weirton Steel Corporation's Outlet 004

Dear Ms. Chatfield:

The Office of Water Resources has completed the review of the referenced report submitted by Mr. Larry L. Simmons, P.E. of Energy & Env. Management, Inc. with his letter dated June 2, 1997 on behalf of Weirton Steel Corporation.

First of all, please note that the report does not include the results and discussion of results of all the benthic surveys conducted in Harmon Creek by Weirton Steel under terms and conditions of their WV/NPDES permit. As per 40 CFR Part 125.71(c), the term balanced indigenous community is synonymous with the term balanced, indigeneous population in the Act and means a biotic community typically characterized by ----- presence of necessary food chain species and-------. Therefore, inclusion of the benthic survey results and discussion of results is necessary to show that there is no appreciable harm to biotic community (or aquatic life). From this view point, the referenced report should be considered as incomplete. Therefore, you may want to consider to return it to Weirton Steel.

To study impacts of Harmon Creek (Outlet 004) on the downstream aquatic life in the Ohio River, Weirton Steel attempted to carry out benthic survey during 1994, but unfortunately multiplate benthic samplers were stolen. Then, during 1995, Weirton Steel repeated the work. However, until now, Weirton Steel has not submitted the report on this work in spite of several verbal requests of Mr. Naresh Shah of the agency. This report should be made a part of 316(a) study.

Similarly, during 1985, Mr. Donald Mount of U.S. EPA carried out instream toxicity tests in the Ohio River in vicinity of Harmon Creek to study impacts of Harmon Creek on the downstream aquatic life in the Ohio River. This report should also be made a part of 316(a) study. Obviously, results of all these studies are indicative of combined impacts of temperature and other pollutants.

The agency does not concur with the final conclusion " The thermal effluent from Outfall 004 is not adversely affecting the balanced indigenous fish community. Therefore, the approval of the Section 316(a) Variance for Outfall 004 to Harmon Creek will not adversely impact the fish community of Harmon Creek." because of the following reasons:

1. This 316(a) report fails to show that there is no appreciable harm to benthic community in Harmon Creek. As a matter of fact, results of all previously submitted benthic survey reports have shown adverse impacts on benthic community.

2. The report is incomplete as discussed above.

3. Comments under Sections 4.4.1 and 2 do not support the final conclusion. These comments are as follows:

(a) Forage fish, which serve as food for the sport fish, theoretically may be affected from June through September of each year.

(b) Theoretically, sport fish may have been impacted to some extent in 1995 and might have had minimal impact in the other two years.

(c) Lethal temperatures are avoided by movement upstream or downstream. This is true for fish but not true for less mobile or immobile aquatic life.

(d) Avoidance by the "adult" fish must be occurring -----. This ignores any adverse impacts on juvenile fish, minnows etc. It is true that August of 1995 was extremely dry and hot. Therefore, a limit of 100 F for maximum temperature is too high and hence not protective of the aquatic life under such extreme conditions, especially considering combined impacts of thermal discharges from Outlets 002 and 003 (of Weirton Steel) in the Ohio River upstream of Harmon Creek. Thus, there is a justification to lower the current temperature limit.

(e) Theoretical growth rates for forage and sport fish may have been impacted during some portion of the summer each year.

In brief, the agency can not justify alternate temperature limit for Outfall 004 under criteria for 316(a) variance. If you have

any questions regarding this matter or if you want to discuss this matter, please feel free to contact Messrs. Randy Sovic and Naresh Shah of my staff at 304-558-8855 or TDD number 304-558-2751.

Sincerely,

OFFICE OF WATER RESOURCES

Barbara S. Taylor, Chief

cc: Mr. Jerry L. Ray
Asst. Chief, Permits

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
Post Office Box 1278
Elkins, West Virginia 26241

July 16, 1997

West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311-2126

Dear Board Members:

On June 18, 1997, the U. S. Fish and Wildlife Service received Public Notice from the West Virginia Environmental Quality Board announcing an opportunity to provide comments on proposed changes to West Virginia Water Quality Standards. We understand the deadline for written comments is July 23, 1997. The Service submitted initial comments on March 31, 1997 (Attachment 1). This supplements that letter and is provided in accordance with provisions of the Clean Water Act (33 U.S.C., Section 1344, as amended).

The Board has recommended elimination of the chronic, numeric criterion for aluminum on the basis that chronic value of 87 ug/L is overprotective and not applicable to West Virginia waters. The Service assumes that applicability of the chronic value was questioned because it came from striped bass toxicity studies (USEPA 1988). The striped bass study revealed that seven day exposures to 174 ug/L aluminum resulted in a 58 percent mortality while the same exposure to 87 ug/L caused no mortality. If applicability of species is an issue, sufficient data is found in the U.S. Environmental Protection Agency guidance document to support a chronic aluminum criterion. For example, largemouth bass embryo and larvae exposed for eight days to 170 ug/L of aluminum experienced 50 percent mortality.

Although there are data in the U.S. Environmental Protection Agency guidance document to support a aluminum chronic criterion, the document does contain study results which makes it difficult to select a specific chronic value. Biological activity and toxicity of aluminum is dependent on its interactions with pH and various organic and inorganic molecules (Sparling and Lowe 1996) which may account for some of the disparity. Studies of effects of acid precipitation and related aluminum impacts have provided information that will be helpful in sorting out the complexities of aluminum chemistry and to help derive a protective chronic criterion for aluminum. A chronic value should be developed that accounts for effects of pH and other aluminum interactions.

Elimination of the aluminum chronic criterion will increase aluminum loading to surface waters. The fate and effects of those loads will be largely pH dependent. As pH decreases from circumneutral to a more acid condition, aluminum toxicity increases (Sparling and Lowe 1996; USEPA 1988). This phenomenon is especially important in most of the State's headwater streams. In those areas, the primary aluminum sources are from coal mines. Even though aluminum discharges are required to be carried in mine effluents with pH values of 6.0 to 9.0, the pH values of the infertile receiving streams are often below 6.0, especially during spring runoff. Elimination of aluminum chronic criterion would result in increased aluminum loads to these streams and to increased exposure of aquatic life to the most toxic forms of aluminum.

The selection of an appropriate aluminum chronic criterion is somewhat problematic, however,

there are sufficient data available to indicate a need for a criterion. The Service respectively recommends that the aluminum criterion of 87 ug/L be retained in the Water Quality Standards and that during the next 12 months all available information on aluminum toxicity be evaluated to determine the appropriateness of that standard. The Service also recommends that for development of both the aluminum acute and chronic criteria, site specific effects of various interactions with pH and other relevant organic and inorganic molecules be included in selecting appropriate criteria. The Service offers our assistance during any aluminum evaluations.

If you have any questions, please contact Dan Ramsey, of this office, at 304-636-6586.

Sincerely,

Christopher M. Clower
Supervisor

Literature Cited

Sparling, D. W. and T. P. Lowe. 1996. Environmental hazards of aluminum to plants, fish, and wildlife. Rev. Envir. Contam. Toxicol. 145:1-127.

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Project

United States Department of the Interior

FISH AND WILDLIFE SERVICE

West Virginia Field Office
Post Office Box 1278
Elkins, West Virginia 26241

March 31, 1997

West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311-2126

Dear Board Members:

On February 10, 1997, the U. S. Fish and Wildlife Service received Public Notice from the West Virginia Environmental Quality Board announcing an opportunity to provide comments during the Triennial Review of West Virginia's Water Quality Standards. The closing date for comments is March 31, 1997. The following constitute the comments and recommendations by the Service regarding the Triennial Review of the West Virginia Water Quality Standards.

Aluminum

West Virginia's Water Quality Standards numeric criteria for acute (750ug/L) and chronic (87 ug/L) effects of aluminum may not be sufficiently protective in many of the State's waters, particularly for sensitive aquatic species and immature aquatic life stages, and especially in streams with low pH. Aluminum criteria were established in the mid 1980's, based on relatively sparse data and applied only to waters with pH between 6.5 and 9.0. Studies of impacts of acid precipitation and related aluminum impacts, over the past ten years, have provided sufficient data to establish a more protective aluminum criteria.

Of the dissolved forms, monomeric aluminum (Al^{+3}) is the most toxic. The dissolved forms that are present are dependent on pH. Generally, free Al^{+3}, predominates below pH 5.0, $Al(OH)^{+2}$ from pH 5.0 to 5.5, $Al(OH)_2^{+1}$ from pH 5.5 to 6.0, $Al_{13}(OH)_{32}^{+7}$ from pH 6.0 to 6.5, and $Al(OH)_4^{-}$ at pH greater than 6.5. The pH of the environment, as well as various ligands, can increase or decrease aluminum toxicity but few studies have examined relative toxicities of the various forms of inorganic aluminum. Clark and LaZerte (1985) concluded that Al^{+3} and $Al(OH)_3$ were equally toxic. Other studies have reported $Al(OH)^{+2}$ as the most toxic form and that $AL(OH)_2^{+1}$ may be the most important form controlling bluegill juvenile mortality (cited in Baker et al. 1990) The most toxic aluminum forms are present in waters exhibiting pH ranges that are typical of many of the State's waters, especially cold water streams, Mueller et al. (1991) reported that brook trout exposed to an aluminum concentration of 75 ug/L for four days at a pH of 5.2, developed profound changes in gill morphology that was not a result of low pH alone. The morphological changes in the gill structure resulted in acclimatization of those fish to higher aluminum concentration exposures but restricted oxygen transfer ability and would limit normal aerobic activity.

In establishing aluminum criteria, the interaction of pH should be considered. This interaction has been recognized in Canada. Canadian water quality guidelines limit aluminum concentrations to 5 ug/L in waters with pH of 6.5 or below (cited in Wren and Stephenson 1991).

Aluminum toxicity in many fish species is bimodal in that it causes asphyxiation at higher pHs (approximately 5.5 to 6.5) and interferes with electrolyte balance at lower pH. Because of this

bimodal toxicity, reduction of surface water acidity through liming or by mixing low and high pH waters may actually increase fish mortality at the point of mixing (Sparling and Lowe 1996).

In September 1996, the West Virginia Division of Environmental Protection asked the WV Environmental Quality Board to re-evaluate the aluminum standard. The request was based on data collected between 1990 and 1995 that showed a high frequency of aluminum violations (total aluminum concentrations) in State waters. The Division of Environmental Protection believes the high aluminum concentrations represent background conditions and that no adverse biological impacts have resulted from those concentrations. They have requested that either the total aluminum criterion be raised or that the criterion be changed to dissolved aluminum.

Because of the complexities of aluminum chemistry, trend analysis would have to be done carefully. For example, an aluminum study of the Choptank River, Maryland revealed that aluminum concentrations during a year with high rainfall were two to five times higher than a low rainfall year (USEPA 1990). If analysis of comparable data revealed increasing aluminum levels over time, it is likely the source would be point or non-point pollution rather than natural geologic events. If aluminum concentrations are increasing in State waters, it is probable that the increases are a result of increased erosion from development (agriculture, timbering, etc.), a result of acid precipitation, or increased use of alum at water treatment facilities (which may be a reflection of changes in organic loads or pH).

Biological impacts resulting from gradual increases of aluminum may be subtle and would require more than routine biological monitoring to identify. The effects of aluminum vary among organisms, pH and other factors of water chemistry. To adequately assess aluminum impacts, monitoring programs should be designed to assess the most aluminum sensitive communities. Native brook trout streams or any of the smaller infertile streams are more susceptible to effects of acid precipitation. In those acidic streams, a larger proportion of the total aluminum concentrations would be the more toxic aluminum forms. In waters with pH values ranging from 4.0 to 7.7 aluminum concentrations of 200 ug\L to 680 ug\L have resulted in significant sub-lethal effects to aquatic organisms. The sub-lethal effects include 50 percent reproductive impairment of Daphnia magna and significant physiological impairment of crayfish (Sparling and Lowe 1996).

The Service recommends that the aluminum criteria concentrations not be raised in response to possible increased incidence of aluminum violations. If comparable data shows an increase in aluminum concentrations over time, efforts should be made to determine the possible point and non-point sources and to eliminate or reduce those influences.

Selenium/Site-Specific Criteria/Wildlife Criteria

Section 7.2.d provides a list of waters where exceedence is allowed for various regulated water quality parameters. These site specific exceptions to numeric criteria have the potential to impact Service trust resources. For example, site-specific numeric criteria for arsenic, selenium, and iron have been granted for a tributary of Fish Creek of the Ohio River. The site-specific selenium variance of 62 ug\L is three times higher than West Virginia's selenium, acute criterion (20 ug\L), established in 1987, for aquatic life protection.

In a recent review of aquatic life criteria for selenium, the U.S. Environmental Protection Agency (1994) reported that the aquatic life chronic criterion of 5 ug\L may not be adequately protective. The 1987 selenium criteria were based on the assumption that selenium toxicity is a result of uptake from the water column. Data since 1987 has shown that selenium uptake via the food chain is more important and that both inorganic and organic forms of the metal must be considered when assessing toxicity. Lemley (1993) reported that metabolic stress during winter increased the toxicity of selenium and recommended that waterborne concentrations of 2 ug\L or greater should be considered hazardous to fish.

Selenium concentrations in invertebrates and fish have been found six times higher than in their food source and 2000 times higher than selenium concentrations in the water column. Migratory birds exposed to selenium contaminated water and food have experienced significant mortalities, and reproductive failures (Ohlendorf 1989). Threshold estimates for birds and mammals with food habits that likely lead to high exposure to bioaccumulative contaminants in aquatic systems has been reported as 1 ug\L for waterborne selenium (Peterson and Nebeker 1992).

West Virginia's selenium numeric criteria may not adequately protect aquatic life or wildlife. A large heron rookery exist on Fish Creek Island, adjacent to the Fish Creek embayment. An excursion above selenium criteria poses a threat to herons via bioaccumulation by fish and invertebrates that serve as heron forage.

The Service recommends that selenium criteria be re-evaluated. We also request opportunities to provide comments during future considerations of site-specific variances to water quality criteria. The selenium variance for Fish Creek illustrates the importance of developing water quality criteria that are protective of wildlife. The Service recommends establishment of water quality standards that are protective of wildlife.

Water Use Categories

There should not be a water use Category B-3 ("small non-fishable streams"). This designation implies that only large streams that contain certain species will receive full protection. All aquatic life is to be protected under the Clean Water Act. Small, non-fishable streams are integral and indispensable parts of the stream system and must receive full water quality protection. Small streams support a variety of aquatic species that are important to the system, as a whole. Some small streams harbor Federally listed endangered species or species of concern. Streams presently considered B-3 streams should be included in either B-1 or B-2 categories.

Category B-1 should include all warm-water streams and no distinction should be made concerning the presence or absence of sports fish.

Wildlife criteria should be provide for Category D-3.

Low Flow and Intermittent Streams

Intermittent streams (when they are dry or have no measurable flow), any stream with less than 7Q10 flows, and wet weather streams are presently exempt from numeric water quality standards. Rather than exemptions, these streams should receive special protection. The Clean Water Act (section 101(a)(2)) requires protection of aquatic life.

Wet weather streams or streams which may exhibit periods of intermittency, or 7Q10 flows, provide, in the long term, significant exports of nutrients and forage for downstream aquatic life, and during some periods provide nursery and reproductive areas for a variety of aquatic organisms. If these streams are exempt from water quality standards, it is likely that at some point, either spatially or temporally, aquatic life will be impacted and existing uses will not be preserved. Section 7.2.c.B would prohibit water quality exemptions for those streams if downstream waters are adversely impacted, but no guidance or procedures are provided that could determine downstream effects.

Designation of streams as intermittent is a subjective exercise. Intermittent streams are defined as "dry" streams or streams "with no measurable flow" (section 7.2.c.B) or "...streams which have no flow during sustained periods of no precipitation and which do not support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six months." (section 2.9). However, a stream with no measurable flow often contain pools that hold significant

aquatic resources (e.g. brook trout, aquatic invertebrates). Those pools, as well as dry stream beds, also provide significant downstream nutrient inputs when water levels rise. A "dry" stream (intermittent, wet weather, or perennial) usually contains seepages and beneath-bed flows that provide significant contributions to downstream residual pools and lower flowing stream segments. During periods of "no precipitation", streams, that in the long-term, would be considered perennial could be considered intermittent and exempt from water quality standards.

If you have any questions, please contact Dan Ramsey at 304-636-6586.

Sincerely

William A Tolin

William A. Tolin
Acting Supervisor

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July 21, 1997

Dr. Charles R. Jenkins, Chairman
West Virginia Environmental Quality Board
1615 Washington St. E.; Suite 301
Charleston, West Virginia 25311-2126

Re: Water Quality Standards Triennial Review

Dear Board Members:

These comments on the proposed revisions to the state's water quality standards (46 CSR 1) are submitted by Allegheny Power who generates electrical energy at six coal-fired power plants and provides electrical service to 322,000 customers in the northern half of West Virginia. Allegheny is a member of the West Virginia Manufacturers Association and Chamber of Commerce and supports the comments submitted by those organizations. We also support the comments of American Electric Power whose interest in West Virginia's environmental quality and economic vitality is closely aligned with Allegheny's.

As the Board has acknowledged via this rulemaking scientifically sound and reasonable, yet environmentally protective water quality standards are critical to the economic future of West Virginia. Standards are the cornerstone of the state's water quality management program from which industrial and municipal wastewater discharge limitations are derived. As such, arbitrary and overly stringent standards will result in significant wastewater treatment costs that may not be necessary to protect the receiving waters. As the state implements total maximum daily loads (TMDLs) in individual watersheds, sound and equitable standards will become increasingly more important because there are limited water resources to allocate among all users. Yet the standards must provide sufficient environmental protection in order to adequately protect the designated uses of the state's water resources.

1. *Water Quality Criteria.* As a general comment, we commend the Board for carefully scrutinizing the EPA water quality criteria before adopting them as state water quality standards. The EPA derives these criteria from laboratory tests for protection of the most ecologically sensitive waters nationwide. Therefore, for the most part, they are extremely conservative and overly protective. Ambient data, from the State's waters, indicate EPA's criteria are often exceeded without adverse ecological effects. Moreover, before adopting and/or revising a criterion, the Board is encouraged to evaluate the water quality criteria of neighboring states to ensure that West Virginia industry is not competitively disadvantaged by overly restrictive standards.

   A. *Dissolved metals.* Allegheny applauds the Boards effort to understand the dissolved metals issue and supports the formation of a workgroup to evaluate and recommend a translator that will be used by DEP to convert dissolved metals criteria to total recoverable permit effluent limitations. We are committed to assisting the workgroup develop a workable translator that will use the best possible science to ease the administrative burden on the Office of Water Resources permit writers and ameliorate the conservatism built into EPA's trace element criteria. The EPA has recognized via national guidance that it is the dissolved form of the metal rather than the total component that is toxic to aquatic life and has encouraged the states to express their water quality criteria as dissolved. The apparent discrepancy between the toxic effects of metals on aquatic life in laboratory tests (on which the EPA criteria are based) and the observed effects in surface waters can be attributed to the differences between the physical and chemical forms of the metals in the

two environments. A number of states including the neighboring states of Maryland, Pennsylvania, Ohio and Virginia have adopted dissolved criteria for metals and metalloids and are successfully translating to total recoverable permit effluent limitations. Furthermore, EPA's interim final National Toxics Rule (60FR 22228, May 4,1995) establishes numeric aquatic life dissolved metals criteria for nine states plus the District of Columbia and Puerto Rico. Allegheny encourages the Board to move forward with this effort as rapidly as possible so that West Virginia industry is not competitively disadvantaged.

B. ***Aluminum.*** The EPA aluminum chronic criterion of 0.087 mg/l is technically flawed, therefore, we support the Board's proposal to delete it until a more appropriate criterion can be developed. Following the EPA 1985 National Guidelines for Deriving Water Quality Criteria both the acute and chronic criteria should be 0.75 mg/l. However, the EPA has lowered the chronic criterion to 0.087 mg/l to protect striped bass and brook trout based on suspect data from Buckler et al. and Cleveland et al. respectively. The EPA has acknowledged these discrepancies, but has failed to make the appropriate correction. Therefore, the Board is justified in deleting the chronic criterion. Moreover, the states of Kentucky, Maryland, Ohio, and Virginia have not adopted an aluminum criterion. Pennsylvania has rejected the EPA chronic criterion and is proposing to adopt an acute and chronic criterion of 0.75 mg/l.

   Aluminum is a naturally occuring element common to soils, rocks, and coal and readily leaches to streams and rivers. Therefore, the naturally occurring background concentration of aluminum in West Virginia surface waters often exceed several mg/l and averages around 0.5mg/l in the larger rivers. It simply makes no sense to retain a water quality criterion whose concentration is significantly less than ambient waters that are known to support diverse aquatic communities. We, therefore, urge the Board to delete the chronic aluminum criterion and work with the DEP and other stakeholders to develop a chronic aluminum criterion appropriate for West Virginia waters.

C. ***Manganese and Iron.*** Allegheny Power supports the Board's proposal to delete the aquatic life criterion for manganese. The origin of the existing state criterion is unknown, but it does not appear to be toxicity-based; because the EPA does not have, nor has it had, a manganese criterion for protection of aquatic life. Moreover, the EPA "Red Book" states that "manganese is not considered to be a problem in fresh waters". Moreover, the EPA iron criterion of 1.5 mg/l is not toxicity based and should be evaluated as to its applicability to state waters. In this light, Allegheny encourages the Board to form a workgroup of interested stakeholders to evaluate and recommend an iron criterion based on the best possible science.

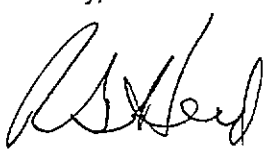
2. ***Section 2.11.*** The Board proposed to change the definition of the source of "natural" or "naturally occurring" background concentrations by eliminating persons as sources and substituting <u>any point or nonpoint source</u>. The consequence of this change is that pollutants contributed by abandoned mine drainage may no longer be considered naturally occurring background. Allegheny believes that the elements common to abandoned mine drainage are naturally occurring, because the source is abandoned and no person is legally responsible for controlling the discharge. Moreover, these elements originated from natural geologic formations specific to the watersheds in which the mining occurred. As a consequence of the industrial age and several world wars, the waters of the state carry, and will continue to carry, elevated concentrations of iron, aluminum, manganese and other elements, which are in large part due to discharges from abandoned mines. There will never be sufficient resources to eliminate this drainage, nor will we have the ability to determine what portion of a rivers loading is attributable to mine drainage. Therefore, the Board should continue to define naturally occurring background concentrations as all constituents except that contributed directly by a person or persons. Section 2.11.b should read: *Those water quality values which exist unaffected by the discharge, or direct or indirect deposit of, any solid, liquid, or gaseous substance by any person <u>from any point source or non point source for which an owner or operator can be identified</u>.*

3. ***Site-specific criteria for Fly Ash Run and Unnamed Tributary of Daugherty Run.*** Allegheny appreciates the Board's support of our proposed site-specific criteria for aluminum, iron, manganese, and selenium in two tributaries of Daugherty Run. Concentrations of these constituents in excess of the existing state water quality standards are present in leachate underdrain and surface water discharges from the Albright Power Station Ash disposal facility. Compliance alternatives, in addition to development of site-specific criteria, include advanced wastewater treatment or construction of a 1.5-mile pipeline to transport the effluent to the Cheat River where additional dilution is available. The site-specific criteria alternative is not only the least cost alternative, but importantly, does not consume energy, produce sludge byproducts, and cause adverse environmental impacts.

   We undertook development of site-specific criteria only after a careful analysis of eight years of benthic macroinvertebrate data collected from monitoring stations on the streams of concern showed no ecological impact. The subsequent study plan was developed in cooperation with Ms. Libby Chatfield, representing the Board, and both DEP and EPA representatives. The assessment methods employed were state-of- the art conducted in accordance with EPA protocols verifying, we believe, that the proposed site-specific criteria will protect the aquatic ecosystem. Therefore, we ask that you approve and recommend these new criteria to the Legislature.

Thank you for considering these comments.

Sincerely,



Richard S. Herd

RSH:klp

BOWLES RICE
MCDAVID GRAFF & LOVE, P.L.L.C.

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July 21, 1997

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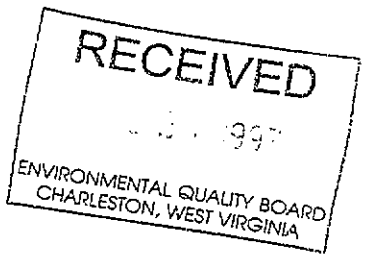


Re: Proposed Rule
46 CSR § 1 - Water Quality Standards

Dear Chairman Jenkins:

On behalf of Century Aluminum of West Virginia, Inc. ("Century"), formerly Ravenswood Aluminum Corporation, I offer the following comments. The Environmental Quality Board (the "Board") proposes to delete the chronic criterion for aluminum in the proposed Water Quality Standards rule, 46 CSR § 1, filed with the Secretary of State's office on June 18, 1997. Century supports this change.

Chronic Aluminum Criterion

The Board is correct in its assessment that the data relied upon by the United States Environmental Protection Agency ("EPA") to justify the current chronic aluminum criterion of 87 µg/l is inadequate. Chronic criteria are typically calculated by determining the acute-chronic ratios for acutely sensitive species. In the case of aluminum, calculating the acute to chronic ratio for the most acutely sensitive species results in a chronic criterion which is *higher* than the acute criterion of 750 µg/l. According to the guidance document relied upon by EPA for calculating numeric criteria, in such instances the chronic criterion should be equal to the acute criterion of 750 µg/l.

Instead of doing this, EPA attempted to rely on an alternate method of establishing the chronic criterion. According to the guidance document for deriving numeric criteria, EPA may adopt the chronic value for a commercially or recreationally important species as the chronic criterion instead of using the calculated chronic value. In other words, EPA may adopt the chronic value for one particular species as determined in laboratory studies instead of a chronic criterion calculated from the chronic values for multiple species. In setting its chronic criterion, EPA rejected its calculated chronic criterion and instead relied on data from two unpublished studies for two species to set the chronic criterion. EPA's reliance on these two unpublished studies is seriously misplaced.

The unpublished studies relied upon by EPA to set the chronic aluminum criteria are of questionable validity for several reasons. First, and most importantly, the two studies relied upon by EPA do not report final chronic values for the two species, and therefore cannot justify adopting a lower chronic criterion. Second, the two studies had deficiencies which made them inadequate for use in the actual calculation of the chronic and acute criteria, and in fact were excluded by EPA from those calculations. Third, the study relied upon for striped bass was internally inconsistent. While 160 day-old striped bass experienced 100% mortality at 349 µg/l, both 159 day-old and 190 day-old striped bass experienced 0% mortality at 390 µg/l, the highest concentration to which they were exposed. Surely, the results of this study for 160 day-old striped bass are suspect. Finally, the brook trout study relied upon by EPA was performed by the same scientists during the same time period as the striped bass studies and are therefore equally suspect.

As this review demonstrates, the chronic aluminum criterion adopted by EPA is without scientific support. It has been questioned by other states. Its deletion from the West Virginia water quality standards, as proposed by the Board, is justified.

Acute Aluminum Criterion

Although the proposed Water Quality Standards rule retains the acute aluminum criterion, Century requests that the Board also reevaluate the acute criterion based upon the technical deficiencies in EPA's final acute criterion. This reevaluation will likely lead the Board to permanently modify or delete the acute aluminum criterion. The acute criterion is very low because the calculation is based on data for only fourteen genera. Generally, only the four lowest genus mean acute values are used in the calculation of the acute criterion. Assuming that data was available for 20 genera instead of 14 and that the four lowest values remained the same, the acute criterion would increase to 1072 µg/l. An additional reason for the low acute criterion is the data variability. Because the reported toxicity values for the two most sensitive genera are considerably lower than the values for the third and fourth most sensitive genera, the acute criterion is *less* than what it would be had aluminum been more toxic to third and fourth most sensitive genera. In other words, had the third and fourth genera been more sensitive to aluminum, then the acute criterion would have been higher. This counterintuitive result is due to the statistical method employed in the calculation of the acute criterion.

In addition, most of the studies relied upon by EPA in calculating the acute criterion did not consider the ameliorating effect that certain stream conditions, such as hardness and organic content, have on aluminum toxicity. Finally, the Board's limits are set as total metals concentrations, while EPA's aluminum criteria are acid soluble concentrations. Therefore, the Board's aluminum criteria are even more stringent than EPA's.

At the June 3, 1997 meeting, DEP stated its intention to study the aluminum concentrations and their effects in streams throughout the State over the next year. DEP expressed its belief that even though many of the streams in West Virginia exceed the

aluminum criteria, the aluminum concentrations were having no harmful effect on aquatic life. The Board stated its intention to reexamine the aluminum criteria next year. This presents an appropriate mechanism to establish a final acute criterion for aluminum. Century requests that the Board incorporate a reevaluation of the acute criterion in this process. Century commends the Board's willingness to review aluminum issues next summer, even though this timing does not correspond to the triennial review.

Until the Board has the opportunity to reevaluate the aluminum criteria over the next year, Century suggests that the Board adopt an interim acute criterion of 1496 µg/l. EPA calculated a Final Acute Value for aluminum of 1496 µg/l, which was divided in half to determine the acute criterion. Because of flaws in EPA's acute aluminum criteria (some of which are described above), the calculated value of 1496 µg/l is considerably more stringent than required to protect aquatic life. Accordingly, in the interim Century urges the Board to adopt a revised acute criterion of 1496 µg/l.

Dissolved Metals

Century also supports the development of dissolved water quality criteria for metals, including aluminum. The dissolved concentration represents the toxic portion of the total metals concentration and therefore more accurately reflects the level of protection necessary for aquatic life. At its June 3, 1997 meeting, the Board formed a committee to study the issues associated with the adoption of dissolved criteria.

Other Points

Finally, Section 8.1 of the chart of specific water quality criteria contained in Appendix E of the proposed rule contains an incorrect reference. Century believes the reference to 7.2.d.B(b) should be 7.2.d.2.B.

Thank you for the opportunity to comment on this matter.

Very truly yours,

Leonard Knee

LK/jlh

CHS-104846

July 18, 1997

Ms. Libby Chatfield
West Virginia State Water Resources Board
1615 Washington Street
Charleston, West Virginia 25311-2126

Dear Ms. Chatfield;

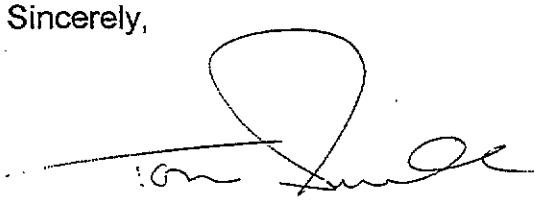
The Silver Council has reviewed the proposed amendments (June 18, 1997) to Rules at 46 CSR 1: *Requirements Governing Water Quality Standards*, with specific focus on the standards for silver. Issues raised in the January 31, 1997 letter to you from Thomas Purcell of The Silver Council have not been changed in the proposal and remain of concern. For your reference, a copy of the referenced letter is enclosed.

The proposed standards continue to call for use of total recoverable instead of dissolved silver. This leads to measures that are far more conservative than necessary, given that only a small fraction of the total silver can be considered bioavailable. The U.S. EPA recognizes this fact, and has issued guidance that recommends the use of dissolved silver as a better estimate of the available fraction. You will find this discussed in item #1 of the January 31, 1997 letter.The Silver Council recommends that West Virginia standards be given as dissolved silver, which provides a more scientifically accurate measure of bioavailable silver.

The State of West Virginia also proposes to leave the chronic standards in place. The Silver Council restates our contention that the toxicity of silver as it exists in the fresh water environments is directly a result of the ionic form of silver. This ionic or "free" form, if it exists in the natural environment, is in such low concentration that acute standards are probably protective.

Thank you for your consideration of our comments. If you have questions, or if you would like us to provide any additional supporting information for our recommendations, please contact me directly.

Sincerely,



Thomas W. Purcell, Ph.D.
Senior Vice President, Science

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COPY

January 31, 1997

Ms. Libby Chatfield
West Virginia State Water Resources Board
1615 Washington Street
Charleston, West Virginia 25311-2126

Dear Ms. Chatfield;

In our telephone conversation on December 16, you said that West Virginia would be starting its triennial review of water quality standards this year, with a request for initial input to be published in late January or early February. The Silver Council is writing to provide you with materials pertaining to the possibility for changes to West Virginia's water quality standards. Specifically, we are providing information encouraging the deletion of the chronic water quality standards for silver and stating the standards as "dissolved" silver rather than total recoverable.

We believe the scientific data show that silver as it is discharged from photoprocessing operations and as it occurs in the environment is of low toxicity, and that the chronic standards in effect are overly protective. This is supported by U.S. Environmental Protection Agency guidance on standards for silver and other metals, and the status of other states in regulating silver. This letter and the references provided are far from exhaustive, but I believe that they cover the important issues concerning silver in the environment. If you want additional information or clarification on any point, please call or write me at the address below.

The Silver Council and our predecessor organization, the Silver Coalition, represent the manufacturers and users of photographic imaging materials. Dentists, veterinarians, doctors, hospitals, photographers, printers, financial institutions, photographic processing services, police departments and numerous colleges and universities use silver-containing photographic materials that must be processed to produce an image. After processing and silver removal, some residual silver may be found in the wastewaters which are generally discharged to sewage treatment plants. Therefore, a great number of small and large businesses throughout West Virginia are potentially impacted by changes to the regulations.

The specific scientific and policy issues addressed here are:

1. U.S. EPA guidance says that because of the variation in the results of silver toxicity tests, they can not determine chronic criteria for silver, and that states do not need to have a chronic value for silver in standards; the U.S. EPA also considers the use of dissolved metal, as opposed to total recoverable metal, to be the closest approximation of the bioavailable portion of the metal;

2. ionic or "free" silver (Ag^+), the most toxic form, is the only form used by U.S. EPA in determining the ambient water quality criteria, and was the form used in the test from which a lowest observed effect level of 0.12 µg/L was estimated;

3. laboratory tests of the the toxicities of the silver compounds found in the environment - silver chlorides and silver sulfide - as well as silver thiosulfate complexes are orders of magnitude less toxic than the free ion of silver (Ag^+);

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4. the compounds/ forms of silver found in POTW influents, effluents and downstream of discharges are the less toxic forms, not ionic silver;

5. the actions taken by other states regarding chronic water quality limits.

The issues are addressed below, by number.

1. U.S. EPA guidance says that because there is variation in the data, they can not determine chronic criteria for silver, and that states do not need to have a chronic value for silver in standards.

I am providing a copy of a memorandum from Dr. Tudor Davies, Director of the Office of Science and Technology, Office of Water, U.S. EPA to the Water Management Division Directors in the regional offices (Attachment 1). In it he says that there is no chronic criterion for silver, and that although states can put chronic values in standards, this is more stringent than EPA criteria and EPA does not recommend that the states do so.

I have also included copies of selected pages from the 1995 Federal Register (60 FR 22228 - 22237 and the correction at 60 FR 44120)(Attachment 2) that formally provide, in the context of the National Toxics Rule, the criteria for silver, without chronic values, adjusted for measurement as "dissolved" metal. This gives the most up to date recommendation for the application of silver criteria.

Clearly EPA has concluded that the data variability is too great to determine a chronic criterion for fresh water and they do not recommend nor require that states have chronic values in their water quality standards for approval. Further, their guidance shows that EPA policy on the use of total recoverable metals in standards has recently changed. They now recommend that dissolved metal be used to "...set and measure compliance with water quality standards... because dissolved metal more closely approximates the bioavailable fraction of metal in the water column..." (60 FR 22230). In conjunction with these recommendations, they provide a method of converting total recoverable to dissolved values.

2. Ionic or "free" silver is the most toxic form.

It is well documented that ionic or "free" silver is the most toxic form, and much of the compelling information comes from laboratory work which compares the toxicity of silver nitrate ($AgNO_3$, which dissociates in water to "free" silver, or Ag^+) with other silver compounds. This is discussed more fully in the response to issue 3 in this letter. It is significant that recent experimental work has pointed to a probable mechanism of toxicity that explains why ionic silver is so potent and other compounds and complexes of silver are many times less toxic. This mechanism is supported by the chemodynamics of silver in the environment.

Cooper and Jolly (1970) indicated that ionic silver is the most toxic form of silver, and subsequent work by a number of investigators [for example, Buccafusco *et al* (1981), Nebecker *et al* (1983), LeBlanc *et al* (1984)] has repeatedly demonstrated this to be true.

Davies *et al.* (1978) exposed juvenile rainbow trout to silver as silver nitrate in test systems containing both soft (23 mg/L as $CaCO_3$) and hard (350 mg/L as $CaCO_3$) water. The 96-hr

LC_{50}s were 6.5 and 13.0 µg/L, respectively. The long-term "no-effect" concentration in soft water was between 0.09 and 0.17 µg/L, extrapolated by the authors to a 0.12 µg/L no-effect level. The effects seen in this 18-month experiment were premature hatching of eggs and reduced growth rate in fry; premature fry that were poorly developed and frequently died. The experimental exposure in their chronic work was made using silver nitrate in soft water, the conditions under which silver is most toxic. While low concentrations of ionic silver are quite toxic, as shown in the Davies *et al.* work as well as in the EPA summary tables from the Ambient Water Quality Criteria Document for Silver (1980), the information on the forms of silver that exist in the environment show that we are very unlikely to see significant concentrations of ionic silver.

Effects were significantly less in the Davies *et al.* (1978) hard water treatment. They suggest that silver is not as toxic in hard water or water containing chloride because silver added as $AgNO_3$ "would be complexed into silver forms and species which are probably, for the most part, not toxic." Hogstrand *et al.* (1996) showed that for juvenile rainbow trout, silver thiosulfate or chloride complexes are at least 4 orders of magnitude less toxic than ionic silver, based on the concentrations that will cause lethality in half of the exposed organisms, the LC_{50}s.

Recent investigations have led to the conclusion that ionic silver is so toxic because silver ions act competitively at the gill surface, blocking critical sodium (Na^+) and chloride (Cl^-) ion exchange pathways (Janes and Playle, 1995; Hogstrand *et al.*, 1996; Wood *et al.*, 1996a). The epithelium of the gills contains negatively charged binding sites. Metals such as silver in its ionic or free state (Ag^+) are attracted to these sites, and competition probably occurs between the silver and other anions for these sites (Reid and McDonald, 1991). Recently, Wood *et al.* (1996a) described work in which adult rainbow trout were exposed to $AgNO_3$ for 6 days: total silver was measured at 10.9 µg/L. Plasma [Na^+] and [Cl^-] declined steadily during exposure, and that, along with other physiological changes, demonstrated disruption of the ion transport at the gill surface.

3. The toxicities of the dominant silver compounds in POTWs and in the environment - silver thiosulfate complexes, silver chloride, silver sulfide - are less than that of ionic silver.

Materials that complex with silver, such as sulfates, thiosulfate, chloride and dissolved organic carbon, reduce the ability of silver to compete, and subsequently reduce its toxicity (Pagenkoph, 1983). Janes and Playle (1995) demonstrated, using their data and the MINEQL$^+$ model, that complexing agents (dissolved organic material, Cl, and thiosulfate) as well as competing solutes (Na, Ca) present in natural waters offer protection against silver accumulation on the gills.

The compounds of silver tested other than silver nitrate have been found to be orders of magnitude less toxic to aquatic organisms than the free silver ion (Ag^+), tested as $AgNO_3$ (Hogstrand *et al,* 1996). In this study, 96-hour and 168-hour LC_{50} values for rainbow trout of silver thiosulfate, $Ag(S_2O_3)_n$, were 13,000 and 15,000 times greater (i.e.,less toxic) than comparable LC_{50} values for silver nitrate: 161,000 and 137,000 µg Ag per L, respectively, versus 11.7 µg/L and 9.1 µg/L. They were not able to determine the LC_{50} of $Ag(Cl)_{(n)}$ because of the low solubility of that compound. There was no observed mortality at the highest test concentration, 100,000 µg Ag per liter.

LeBlanc *et al.* (1984) tested the acute toxicity of silver nitrate, silver chloride, silver sulfide and silver thiosulfate complexes and the 28-day embryo-larval toxicity of the latter two compounds on the fathead minnow. The acute LC_{50} value for silver nitrate was 16 µg Ag/L in water with a hardness of 38 mg/L as $CaCO_3$. Silver chloride was about 300 times less acutely toxic, silver sulfide was at least 15,000 less acutely toxic and silver thiosulfate was more than 17,500 less acutely toxic. The embryo-larval tests of silver sulfide showed no significant effects to percent hatch, larval survival, average weight or total length at 11,000 µg/L (as total silver), the highest concentration that could be tested based on the solubility of this compound. Similar tests using silver thiosulfate complex provided an estimated MATC between 16,000 µg/L and 35,000 µg/L (as total silver).

Wood *et al.* (1996b) compared the effects of ionic silver (as silver nitrate) with silver thiosulfate complex [$Ag(S_2O_3)_n^-$]. They found that "Whereas 10 µg/L Ag (as $AgNO_3$) caused a variety of internal disturbances related to loss of plasma Na^+ and Cl^-, 3000-fold greater $Ag(S_2O_3)_n^-$ had very minor effects - a moderate transient metabolic alkalosis and an apparent expansion of plasma volume."

The fate and effects of silver, amended as silver nitrate, silver chloride, and silver thiosulfate complexes in varied (e.g., diverse sand: silt/clay ratios; percent organic matter, etc.) freshwater sediments, were studied in static 10-day laboratory experiments (Rodgers *et al.*, 1995). Partitioning of silver to particulates, overlying water and interstitial water were evaluated by measuring dissolved and total acid-extractable silver concentrations periodically for 10 days. Silver concentrations in the sand and silt/clay fractions were also measured. Variation in bioavailability was assessed using *Hyalella azteca*, an amphipod. The 10-day LC_{50} for *H. azteca* exposed to four sediments amended with silver nitrate ranged from 1,500 to over 400,000 µg/kg of silver in dried sediment. When exposed to silver chloride, *H. azteca* were not affected at any test concentration; the 10-day LC_{50} was >2,560,000 µg Ag/kg of dry sediment.

Similarly, *H. azteca* was insensitive to silver as the silver thiosulfate complex, with 10-day LC_{50} values greater than 569,000 µg Ag/kg dry sediment.

4. The compounds/ forms of silver found in POTW influents, effluents and downstream of discharge.

With an idea of the relative toxicities of silver compounds to aquatic organisms, it is interesting to note the composition of photoprocessing effluents. The silver halide present in photographic films and papers is removed by complexing with excess thiosulfate ion in photographic image processing. The predominant complexes are $Ag(S_2O_3)^{2-3}$ and $Ag(S_2O_3)^{3-5}$. These complexes are extremely stable (with a dissociation constant of 5.0×10^{-14}), making it virtually impossible for silver ion (Ag^+) to exist in any significant concentration in photographic processing effluents (Pouradier et al, 1979; Wolfman, 1989).

An analytical study examined speciation and fate of silver in six POTW facilities where the silver influents were municipal and industrial, as well as photographic. All analyses indicated that, regardless of the source of silver, the removal efficiencies generally exceeded 90% with the silver being almost completely incorporated into the sludge (Mytelka, 1973).

As part of an EPA study, Versar measured total and ionic silver concentrations in influents to two (2) POTWs receiving photo-processing wastewaters. Total silver concentrations of 460

and 2,200 µg/L and free silver ion concentrations of 0.00003 and 0.0002 µg/L were reported. EPA recommended that concentration-based limitations not be used for controlling pollutants at photographic processing facilities (Versar, Inc., 1981).

Lytle (1984) measured the silver in effluents of six sewage treatment plants. Total silver concentrations in the influents ranged from 5 to 2,200 µg/L, and in the effluents from <1 to 300 µg/L. Using Ag^+ activity as a surrogate for silver ion, free silver concentrations were estimated in the range of 0.00003 to 0.009 µg/L in the influents and 0.001 to 0.03 µg/L in the effluents. Instream silver concentrations below the POTW outfall were between <1 and 35 µg/L total silver, and ionic or "free" silver was estimated to be between 0.001 and 0.05 µg/L.

Silver occurs in the environment usually as silver sulfide, a compound that is very insoluble in water; silver also forms highly insoluble halides and oxides. Silver ion has a remarkable affinity for SH groups (Kramer, 1995; Petering, 1976). Silver is found naturally in almost all aqueous systems, and surface water measurements indicate that the typical natural range varies from 0.03 to 0.2 µg/L. Samples analyzed upstream and downstream from POTW discharges have not shown any significant differences for silver (Chudd, 1983).

Under acid-volatile sulfide (AVS) conditions, where sulfide is available in the sediment and water column, the silver is tightly complexed as silver sulfide. No toxicity to aquatic organisms would be expected under these circumstances (Berry *et al.*, 1995).

5. Actions taken by other states regarding chronic water quality limits.

Please find attached (Attachment 3) a one-page summary of the status of chronic water quality standards that is based on the information provided by Ron Willson of Photo Marketing Association International.

I believe that the information provided here shows that silver, although toxic in its ionic form, is not a risk when it is considered in environmentally relevant forms and concentrations. The data discussed above make it clear that silver compounds that exist in the environment are far less toxic than the ionic form, the form used in the derivation of the U.S. EPA Ambient Water Quality Criteria. In fact, effects from exposure to silver in natural aquatic systems occur only at concentrations thousands of times greater than those found in the environment. Comparison of the criteria with the toxicity data for compounds of silver point to the conclusion that the acute criterion, because its derivation is so conservative, is protective from chronic effects in the environment. Aquatic organisms should be fully protected through the use of the acute value alone in the state standards, therefore use of chronic standards is overly conservative and should be eliminated to avoid excess regulation.

Wastewaters from processing photographic images, like other wastes, require thoughtful management to ensure protection of the environment. The Silver Council encourages communications and the sharing of information between regulatory offices and the regulated community so that pollution prevention, recycling and compliance goals can be achieved in the most cost-effective manner. The photographic industry has been supporting scientific research on the fate, transport and toxicity of silver in the environment for more than five years. In addition, we have developed The Code of Management Practice for Silver Dischargers (CMP), a set of recommendations for control of photoprocessing effluents that are both protective and

achievable. The CMP can be used in pretreatment requirements or permitting as best management practices. If their implementation is universal, we believe the total loading of silver to sewage treatment facilities and the environment would be reduced. I would be pleased to provide you with additional information, discuss implementation and provide a copy of this Code.

If you have any questions, please contact me so we can address them. The Silver Council will continue to share any information that is available to assure that regulations for the control of silver are protective of the environment, while avoiding over regulation that provides little or no environmental benefit.

Sincerely,

Thomas W. Purcell, Ph.D.
Senior Vice President, Science

COPY

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THE SILVER COUNCIL

Comments before Public Meeting
by
Thomas W. Purcell, Ph.D.
Senior Vice President, The Silver Council
July 21, 1997, Charleston, WV

Good evening.

I am Dr. Thomas Purcell, senior vice president of The Silver Council. My training is in aquatic and environmental science. In the past I have worked as Director of Environmental Programs for the Printing Industry of America and before that as an environmental scientist for the U.S. EPA, with primary responsibility for development of ambient water quality criteria.

The Silver Council represents the manufacturers and users of photographic imaging materials. Dentists, veterinarians, doctors, hospitals, photographers, printers, financial institutions, photographic processing services, police departments and numerous colleges and universities use silver-containing photographic materials that must be processed to produce an image. After processing and silver removal, some residual silver may be found in the wastewaters which are generally discharged to sewage treatment plants. Therefore, a great number of small and large businesses throughout West Virginia are potentially impacted by changes to the regulations.

The Silver Council has reviewed the proposed amendments (June 18, 1997) to Rules at 46 CSR 1: *Requirements Governing Water Quality Standards*, with specific focus on the standards for silver. We find that the issues raised in our January 31, 1997 letter to Ms Libby Chatfield from Thomas Purcell of The Silver Council have not been changed and remain of concern.

The proposed standards continue to call for use of total recoverable instead of dissolved silver. This leads to measures that are far more conservative than necessary, given that only a small fraction of the total silver can be considered bioavailable. Our main points, covered in detail in the January letter, are:

1. ionic or "free" silver (Ag^+), the most toxic form, was the only form used by U.S. EPA in determining the ambient water quality criteria;

2. laboratory tests of the the toxicities of the silver compounds found in the environment - silver chlorides and silver sulfide - as well as silver thiosulfate complexes are orders of magnitude less toxic than the free ion of silver (Ag^+);

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3. the compounds/ forms of silver found in POTW influents, effluents and downstream of discharges are universally the less toxic forms, not ionic silver;

The forms of silver seen in discharges from photoprocessing operations and POTWs as well as those found in the environment have little effect on aquatic organisms because the silver is not biologically available. The U.S. EPA recognizes this fact, and has issued guidance that recommends the use of dissolved silver, as opposed to total recoverable metal, as the closest approximation of the bioavailable portion of the metal. You will find the issue of silver availability discussed in the January 31, 1997 letter.

The Silver Council recommends that West Virginia standards be given as dissolved metal, which provides a more scientifically accurate indication of any possible effects.

The State of West Virginia also proposes to leave the chronic standards for silver in place. The Silver Council restates our contention that the toxicity of silver in fresh water environments is directly a result of the ionic form of silver, which, if it exists at all in the natural environment is in such low concentration that acute standards are fully protective. U.S. EPA guidance says that because of the variation in the results of silver toxicity tests, they can not determine chronic criteria for silver, and that states do not need to have a chronic value for silver in standards.

The Silver Council urges the State of West Virginia to delete the chronic standards for silver.

Thank you.

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Facsimile

To: Ms. Libby Chatfield
@Fax: 304-558-4116
From: Tom Purcell
Date: Wednesday, July 23, 1997
Re: Comments before 7/21/97 public meeting
Pages: 3 , including this cover

I wanted to provide you with a copy of my comments about the proposed ambient water quality standards for silver, presented before the meeting in Charleston on the 21st of July, 7:00 p.m.. These will supplement the July 18, 1997 letter (Purcell to Chatfield) and copy of the January 31, 1997 letter (also Purcell to Chatfield) I submitted at the Hearing.

Please keep me informed about the progress of the regulations.

Thank you for considering the issues we have raised.

United States Department of the Interior

GEOLOGICAL SURVEY
Water Resources Division
11 Dunbar Street
Charleston, West Virginia 25301
(304) 347-5130 · fax (304) 347-5133

July 23, 1997

Ms. Libby Chatfield
Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311

Dear Libby:

Enclosed are preliminary data tables for 18 dissolved metals in samples from 30 randomly selected wells in the Kanawha-New River basin in West Virginia. The samples were collected as part of the USGS National Water-Quality Assessment (NAWQA) program.

In comparison to the ground water standards for 7 of these metals, Appendix A of Legislative Rule §46-12, these data show no instance of a concentration in excess of the standards. Stated otherwise, the standards are appropriately larger than the concentrations found in these apparently uncontaminated wells in this part of the State, allowing for natural variability.

I emphasize that these data are preliminary. They have passed initial quality-assurance review, but results are not yet back from our laboratory for all sites, and we have not completed our evaluations of replicates and blanks. The complete data set, which may differ in the values at individual sites, will be published in our annual data report next spring. The data also will be used in planned interpretive reports on regional ground-water quality in the basin.

These wells were selected by a random process from the population of shallow wells in good physical condition that are used for water supply by individual households or public supplies of comparable capacity in the Appalachian Plateaus physiographic province and the Kanawha-New River drainage basin. A wide range of other water-quality data has been collected from the same wells, which may be of interest to you in the future.

I hope this information will be of use in the current review of the ground water standards.

Best Regards,

Jim Eychaner

James H. Eychaner
NAWQA project chief

Appalachian Plateau Study Unit Survey - Trace Metals Analyses

LOCAL IDENTIFIER	DATE	TIME	ARSENIC DISSOLVED (UG/L AS AS) (01000)	BARIUM, DISSOLVED (UG/L AS BA) (01005)	BERYLLIUM, DISSOLVED (UG/L AS BE) (01010)	CADMIUM DISSOLVED (UG/L AS CD) (01025)	CHROMIUM, DISSOLVED (UG/L AS CR) (01030)	COBALT, DISSOLVED (UG/L AS CO) (01035)
PINNACLE RK SP	05-14-97	1409	<1	281	<1	<1	2	<1
CAMP CREEK SP	05-14-97	0909	<1	34	<1	<1	2	<1
BLUESTONE WMA	05-22-97	0909	1	31	<1	<1	5	<1
OZMINA WELL	05-13-97	0909	<1	20	<1	<1	<1	<1
RYDER WELL	05-21-97	1609	<1	16	<1	<1	5	<1
PEAL WELL	06-18-97	0909	--	--	--	--	--	--
BRADFORD WELL	05-07-97	1009	<1	588	<1	<1	1	<1
GIBSON WELL	05-19-97	1409	8	180	<1	<1	3	<1
DANGELO WELL	06-16-97	1909	--	--	--	--	--	--
SAM BLACK WELL	05-12-97	1409	13	230	<1	<1	4	<1
PETERS WELL	06-03-97	1309	<1	830	<1	<1	5	<1
GLADWELL WELL	05-13-97	1509	1	195	<1	<1	1	<1
ALBAUGH WELL	06-02-97	1309	1	183	<1	<1	3	<1
EMMONS PARK	05-06-97	1109	<1	237	<1	<1	3	<1
POCAHONTAS MEM	05-21-97	1009	--	--	--	--	--	--
HANSHAW WELL	06-05-97	1209	<1	364	<1	<1	2	<1
HINKLE WELL	06-17-97	1809	--	--	--	--	--	--
TAYLOR WELL	06-16-97	1109	--	--	--	--	--	--
McGRAW WELL	06-03-97	1709	<1	681	<1	<1	2	<1
GREEN WELL	05-28-97	1109	1	205	<1	<1	4	<1
IMDORE PO	05-08-97	1109	<1	207	<1	<1	<1	2
HAWTHORNE GOLF	05-20-97	1009	1	59	<1	<1	3	<1
UNDERWOOD WELL	05-29-97	1209	3	200	<1	<1	5	<1
TYLER WELL	06-11-97	1309	<1	964	<1	<1	2	<1
CAMPBELL WELL	05-05-97	1100	<1	161	<1	<1	7	<1
MATHENY WELL	06-09-97	1309	<1	620	<1	<1	6	<1
KNOTTS WELL	06-04-97	1059	--	--	--	--	--	--
KNOTTS WELL	06-04-97	1100	--	--	--	--	--	--
KNOTTS WELL	06-04-97	1109	<1	1230	<1	<1	3	<1
SHAMBLEN WELL	05-29-97	1809	6	322	<1	<1	5	<1
CASTO WELL	05-27-97	1209	2	251	<1	<1	3	<1
CURRENCE WELL	06-10-97	1109	<1	186	<1	<1	3	<1

PROVISIONAL - SUBJECT TO REVISION

Appalachian Plateau Study Unit Survey - Trace Metals Analyses

LOCAL IDENTIFIER	DATE	COPPER, DISSOLVED (UG/L AS CU) (01040)	IRON, DISSOLVED (UG/L AS FE) (01046)	LEAD, DISSOLVED (UG/L AS PB) (01049)	MANGANESE, DISSOLVED (UG/L AS MN) (01056)	MOLYBDENUM, DISSOLVED (UG/L AS MO) (01060)	NICKEL, DISSOLVED (UG/L AS NI) (01065)
PINNACLE RK SP	05-14-97	<1	260	<1	207	<1	<1
CAMP CREEK SP	05-14-97	<1	8	<1	6	<1	<1
BLUESTONE WMA	05-22-97	3	39	<1	155	1	3
OZMINA WELL	05-13-97	85	3	1	5	<1	2
RYDER WELL	05-21-97	2	5	<1	<1	55	<1
PEAL WELL	06-18-97	--	720	--	--	--	--
BRADFORD WELL	05-07-97	1	45	<1	11	<1	<1
GIBSON WELL	05-19-97	1	<3	<1	<1	3	<1
DANGELO WELL	06-16-97	--	22000	--	980	--	--
SAM BLACK WELL	05-12-97	2	<3	<1	7	5	<1
PETERS WELL	06-03-97	<1	320	<1	45	<1	<1
GLADWELL WELL	05-13-97	1	<3	<1	6	1	<1
ALBAUGH WELL	06-02-97	<1	--	<1	159	<1	<1
EMMONS PARK	05-06-97	<1	89	<1	84	<1	<1
POCAHONTAS MEM	05-21-97	--	--	--	--	--	--
HANSHAW WELL	06-05-97	<1	5400	<1	290	<1	<1
HINKLE WELL	06-17-97	--	55	--	38	--	--
TAYLOR WELL	06-16-97	--	--	--	--	--	--
McGRAW WELL	06-03-97	<1	2800	<1	356	<1	<1
GREEN WELL	05-28-97	<1	--	<1	1530	<1	<1
IMDORE PO	05-08-97	<1	460	<1	311	<1	1
HAWTHORNE GOLF	05-20-97	2	<3	<1	<1	<1	<1
UNDERWOOD WELL	05-29-97	<1	--	<1	12	13	<1
TYLER WELL	06-11-97	<1	950	<1	134	<1	<1
CAMPBELL WELL	05-05-97	3	<3	<1	2	<1	<1
MATHENY WELL	06-09-97	<1	--	1	94	<1	<1
KNOTTS WELL	06-04-97	<1	950	<1	216	<1	<1
SHAMBLEN WELL	05-29-97	<1	--	<1	257	7	<1
CASTO WELL	05-27-97	<1	120	<1	272	<1	1
CURRENCE WELL	06-10-97	<1	1700	<1	188	<1	<1

PROVISIONAL - SUBJECT TO REVISION

Appalachian Plateau Study Unit Survey - Trace Metals Analyses

LOCAL IDENTIFIER	DATE	SILVER, DISSOLVED (UG/L AS AG) (01075)	ZINC, DISSOLVED (UG/L AS ZN) (01090)	ANTIMONY, DISSOLVED (UG/L AS SB) (01095)	ALUMINUM, DISSOLVED (UG/L AS AL) (01106)	SELENIUM, DISSOLVED (UG/L AS SE) (01145)	URANIUM NATURAL DISSOLVED (UG/L AS U) (22703)
PINNACLE RK SP	05-14-97	<1	26	<1	3	<1	<1
CAMP CREEK SP	05-14-97	<1	<1	<1	5	<1	<1
BLUESTONE WMA	05-22-97	<1	140	<1	2	<1	<1
OZMINA WELL	05-13-97	<1	12	<1	4	<1	<1
RYDER WELL	05-21-97	<1	5	<1	3	1	1
PEAL WELL	06-18-97	--	--	--	--	--	--
BRADFORD WELL	05-07-97	--	<1	<1	3	<1	<1
GIBSON WELL	05-19-97	<1	1	<1	5	7	1
DANGELO WELL	06-16-97	--	--	--	--	--	--
SAM BLACK WELL	05-12-97	<1	2	<1	3	<1	<1
PETERS WELL	06-03-97	--	<1	<1	2	<1	<1
GLADWELL WELL	05-13-97	<1	2	<1	6	<1	<1
ALBAUGH WELL	06-02-97	<1	3	<1	3	<1	<1
EMMONS PARK	05-06-97	--	<1	<1	5	<1	<1
POCAHONTAS MEM	05-21-97	--	--	--	--	--	--
HANSHAW WELL	06-05-97	<1	521	<1	3	<1	<1
HINKLE WELL	06-17-97	--	--	--	--	--	--
TAYLOR WELL	06-16-97	--	--	--	--	--	--
McGRAW WELL	06-03-97	--	6	<1	3	<1	<1
GREEN WELL	05-28-97	<1	23	<1	3	<1	<1
IMDORE PO	05-08-97	<1	2	<1	2	<1	<1
HAWTHORNE GOLF	05-20-97	<1	<1	<1	5	<1	<1
UNDERWOOD WELL	05-29-97	--	3	<1	4	<1	<1
TYLER WELL	06-11-97	<1	2	<1	3	<1	<1
CAMPBELL WELL	05-05-97	<1	48	<1	2	<1	4
MATHENY WELL	06-09-97	<1	18	<1	<1	<1	<1
KNOTTS WELL	06-04-97	<1	<1	<1	3	<1	<1
SHAMBLEN WELL	05-29-97	<1	<1	<1	4	<1	<1
CASTO WELL	05-27-97	<1	263	<1	3	<1	<1
CURRENCE WELL	06-10-97	<1	7	<1	3	<1	<1

PROVISIONAL - SUBJECT TO REVISION

WEIRTON
STEEL CORPORATION

PLEASE DELIVER THE FOLLOWING PAGES TO:

NAME Libby Chatfield

LOCATION EQB

FAX NO. 304-558-4116

FROM: Don Bluedorn

ENVIRONMENTAL CONTROL DEPARTMENT-MAB
400 THREE SPRINGS DRIVE
WEIRTON, WV 26062-4989
FAX NO. (304) 797-2391

This transmission consists of 3 **pages, including this cover letter. If this transmission is not complete, call (304) 797-** 4276.

Libby:

COMMENTS: I hope that this is useful to you. We'll see you tomorrow afternoon. Thanks again for everything

Don

Site-Specific Standard for Harmon Creek

Section 7.2.d.16.2 shall be amended to provide as follows:

Except that site-specific numeric criteria shall apply to that segment of Harmon Creek (0-97) from its confluence with the Ohio River to a point 2.2 miles upstream, which shall result in the following effluent limitations on Weirton Steel Corporation's discharge from Outlet 004:

Free Cyanide	70 ug/l, Daily Maximum
Lead	14 ug/l, Daily Maximum
Phenols	10 ug/l, Daily Maximum
Zinc	200 ug/l, Daily Maximum
Temperature	100° F (monitored per Footnote 12 of the permit)
Iron	4.0 mg/l, Monthly Average and 8.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit)
Fluoride	2.0 mg/l, Monthly Average and 4.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit)

Provided, however, that the criteria for Free Cyanide, Lead, Phenols, Zinc, Temperature, and Iron shall not apply, and instead the state-wide criteria for these parameters shall apply, unless: (1) Weirton Steel Corporation submits to the Office of Water Resources on or before May 30, 1999 a report setting forth the water quality of the discharge from Outlet 004 for these parameters during the period from June 1, 1998 to May 1, 1999, and providing an engineering analysis of potential alternatives for reducing the concentrations of said parameters in the discharge; and (2) Weirton Steel Corporation submits to the

Office of Water Resources on a semi-annual basis commencing on December 31, 1997, summary reports on the water quality of the discharge from Outlet 004 and the efforts made by Weirton Steel Corporation during the prior 6 months to improve the quality of said discharge.

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July 23, 1997

VIA HAND DELIVERY

Members of the Environmental Quality Board
1615 Washington Street, East
Charleston, WV 25311

Re: Triennial Review - Comments of the West Virginia Coal Association and the West Virginia Mining and Reclamation Association

Dear Chairman Jenkins and Members of the Board:

On behalf of the West Virginia Coal Association and the West Virginia Mining and Reclamation Association, we enclose seven copies of our comments on the Board's proposed 1997 water quality standards. As always, we thank the Board for its willingness to listen to the concerns of the Associations.

Sincerely yours,

ROBERT G. McLUSKY

RGM/sab
Enclosure
cc: Ben Greene
Elizabeth Chatfield
Rebecca Charles, Esquire
William Raney

CHASFS2:85292

COMMENTS OF THE WEST VIRGINIA COAL ASSOCIATION AND THE WEST VIRGINIA MINING AND RECLAMATION ASSOCIATION ON THE EQB'S PROPOSED MANGANESE STANDARDS

July 1997

The West Virginia Coal Association and the West Virginia Mining and Reclamation Association (the "Associations") together represent most of the coal producers in West Virginia and have an enormous stake in the State's Water Quality Standards. We thank the Board for its continuing willingness to listen to our concerns.

Aluminum: The Associations urge the Board to reject the chronic aquatic criterion of 87 *ug/l* urged upon the Board by EPA as neither necessary nor required by law.

Iron: West Virginia has a warm water fisheries criterion of 1.5 *mg/l* and a cold water fisheries criterion of .5 *mg/l*. The Associations urge the Board to reject EPA's request to adopt a universal criterion of 1.0 *mg/l* and support the formation of a study group determine the future course of the iron criterion as has been expressed by the West Virginia Chamber of Commerce.

Manganese: The Associations applaud the Board's proposal to delete the current aquatic life criterion of 1.0 *mg/l* for manganese. The coal industry is already subject to a technology-based limit of 2.0 *mg/l* (monthly average), and there is thus little risk that removal of the criterion for aquatic life will cause substantial new manganese loadings to West Virginia's streams. EPA has not established an aquatic life criterion and the Associations' members have long struggled with a standard that is both unnecessary and far more stringent than the

standards of our neighboring states. Moreover, the Associations' members spend many hundreds of thousands of dollars a year on manganese removal to meet unnecessary water-quality based effluent limits at great risk that treatment will pose a far greater danger to aquatic life than does the manganese itself.

However, we are concerned that implementation of this proposal will be needlessly complicated and delayed if individual dischargers must each pursue rule making before the Board to establish that they are not also subject to the 1.0 *mg/l* criterion for public drinking water supplies, especially because there are very few human consumption-use streams into which the mining industry discharges, and those that do exist are easily discernible by stream surveys.

In addition to the aquatic life criterion of 1.0 *mg/l* for manganese, there is also a 1.0 *mg/l* criterion for "public water supply uses," which consist of those waters used for human consumption. C.S.R. § 46-1-6.2.a-d. We understand that there is some confusion in the application of the public water supply use to the many small streams into which the coal industry must necessarily discharge. Apparently, there is a belief that DEP, in NPDES permitting, must assume that all streams, including the many ephemeral streams into which the coal industry discharges, serve a human consumption use absent a rule-making by the Board that a particular stream or stream segment does not serve such a use. We believe that any such interpretation of the State water quality standards will not only needlessly complicate a fair and reasonable application of the "public water supply" use, but is also contrary to the language of the standards themselves.

1. **There is No Authority or Requirement to Presume That All Streams Serve a Human Consumption Use.**

The State water quality standards do not create a presumption that all streams and stream segments serve all "uses." Instead, while the regulations do create a presumption that all streams serve aquatic life (Category B) and water contact recreation (Category C) uses, they do not create any such presumption with respect to human consumption (Category A) uses. See C.S.R. § 46-1-61.[1] Indeed, absent this designation of all streams as serving aquatic life and water contact recreation uses, only "existing uses" are protected. "Existing uses" consist only of those uses "actually attained in a water body on or after November 28, 1975 . . .." C.S.R. § 46-1-2.6. See also, C.S.R. §§ 46-1-4.1.1 (policy of State is to protect "existing" uses), -6.2 (Category A waters are limited to those "which, after conventional treatment, are used for human consumption"), & -7.2a.A ("based on meeting [the definition of the particular "uses" identified in Section 6], tributaries or stream segments may be classified for one or more Water Use Categories.")[2] Certainly, neither DEP in its administration of NPDES program nor the State water quality standards presume that

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[1]C.S.R. § 46-1-6.1 provides that:

> "Unless otherwise designated by these rules, at a minimum, all waters of the State are designated for the Propagation and Maintenance of Fish and Other Aquatic Life (Category B) and for Water Contact Recreation (Category C) consistent with Clean Water Act goals. Incidental utilization may or may not constitute a justification for assignment of a water use category to a particular stream segment."

[2]C.S.R. § 46-1-7.2.a.A specifically provides that waters shall be classified based on whether they meet the definitions of the individual water uses set out in C.S.R. § 46-1-6. It also provides that streams may be "classified for one or more Water Use Categories [and that [w]hen more than one use exists, they shall be protected by criteria for the use category requiring the most stringent protection." This language makes clear that not all stream segments are presumed to serve all uses. If they were, then this regulatory language would be surplusage, and the law presumes that such language cannot be mere surplusage.

all streams are "trout streams" (Category B2), "wetlands" (Category B4) or "industrial" waters (Category E4) in determining what criteria to apply in divining permit limits.[3] Accordingly, there is neither any precedent nor any bases for automatically applying Category A to all waters.

2. A Rule-Making Requirement Will be Unnecessarily Burdensome

As the Board is aware, new rules must be approved by the Legislative Rule-Making Review Committee ("Committee") and by the Legislature. The Committee, however, will not submit proposed rules to the Legislature for consideration in the 1998 Legislative Session unless the rule-issuing agency submits the rules to the Committee by August 4, 1997. As a practical matter, this will preclude mine dischargers from obtaining any rule-making relief until at least the 1999 Legislature. We believe that this process is simply too long and cumbersome . In addition, we believe that if the Board requires rulemaking, then it will be faced with dozens, if not hundreds, of such petitions that will simply overwhelm the already over-taxed resources of the Board.

3. The Solution

Although, rightfully, NPDES permits should be issued to mining companies without public drinking criteria absent evidence that the receiving stream is used for human consumption, the members of the mining industry are generally willing to produce evidence to the DEP, as part of the NPDES permit process (which is subject to public

---

[3]We are aware of language in E.I. DuPont de Nemours and Co., Inc. and Affiliated Trades Foundation v. Chief, Nos. 599 & 602 (EQB Dec. 13, 1995) which affirmed the Chief's decision to apply Category A criteria to a section of the Ohio River notwithstanding DuPont's contention that its discharges were more than five miles upstream of any public water in-take. There, however, The Board utilized other evidence to find that "the waters of the Ohio River are used for human consumption," a fact which rarely exists for the small streams into which the mining industry most often discharges. Thus, absent other evidence that a stream is used for human consumption, the rationale is the DuPont case is inapplicable to the mining industry.

review), that particular streams or stream segments do not serve as Category A waters in order that the discharger avoid application of the human consumption standards. Moreover, we suggest that, if the Board desires more public notice, it can simply require that DEP annually submit to the Board, for public review, a list of those stream segments into which the mining industry discharges manganese and which DEP does not consider to be Category A waters. Then, any affected person could challenge either the issuance of a specific permit or the more general listing process without the need for dozens of individual company-sponsored rule-making requests being submitted to the Board on a continuous basis.

CHASFS2:77224

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DATE: July 23, 1997

TELECOPY COVER SHEET

TO: Environmental Quality Board 558-4116
(C/M#) 90286/7539

FROM: ROBERT G. McLUSKY (TEL) (304)340-1381

SPECIAL INSTRUCTIONS: Original to be hand delivered

TOTAL # OF PGS. INCLUDING COVER SHEET: 7

FOR CONFIRMATION OR PROBLEMS, CALL (304) 340-1205

Before the

ENVIRONMENTAL QUALITY BOARD

Comments of the

WEST VIRGINIA MANUFACTURERS ASSOCIATION

regarding the

TRIENNIAL REVIEW OF WEST VIRGINIA WATER QUALITY STANDARDS

46 C.S.R. 1

JULY 22, 1997

BEFORE THE ENVIRONMENTAL QUALITY BOARD
comments of the
WEST VIRGINIA MANUFACTURERS ASSOCIATION
regarding the
TRIENNIAL REVIEW OF
WEST VIRGINIA WATER QUALITY STANDARDS
46 C.S.R. 1

I. Introduction

The West Virginia Manufacturers Association (WVMA) is a trade organization consisting of manufacturers and associated organizations throughout West Virginia. The WVMA participates in, and comments on, rulemakings that have a significant effect on its members' operations.

The Environmental Quality Board ("the Board") has proposed significant changes to state water quality standards. Some of these changes will have a profound effect on manufacturers in this state. For that reason, the WVMA urges the Board to consider carefully the comments set forth below.

II. General Comments

A. Interpretation of the Category A Use.

WVMA is greatly concerned about the application of the Category A use in West Virginia, which we understand has been applied to all streams in the state by the Office of Water Resources. We do not believe that is how it is meant to be applied, nor is it necessary to do so in order to protect human health. We urge the Board to affirm the Category A use as it is described in the water quality standards, and to allow the Office of Water Resources to implement it in a manner that protects human health without stifling development.

The Category A use is defined in the following fashion:

> Category A -- Water Supply, Public. -- This category is used to describe the waters which, **after conventional treatment**, are used for human consumption. This category includes:

a. All community domestic water supply systems;

b. All non-community domestic water supply systems, (i.e. hospitals, schools, etc.);

c. All private domestic water systems;

d. All other surface water intakes where the water is used for human consumption. (See Appendix B for partial listing of Category A waters; see section 7.2.a.B. for additional requirements for category A waters.)

46 C.S.R. 1-6.2 (emphasis added). The use is designated only for those streams that are used as water supplies after conventional treatment, which is defined as "the treatment of water as approved by the State Health Department to assure that the water is safe for human consumption." 46 C.S.R. 1-2.3. Clearly, the Board intended to apply the Category A use to waters actually being used as drinking water source after being treated in a manner prescribed by public health authorities, not to every stream in the state. If the Board intended the use to apply to every stream there would be no need for a list of such streams, even a partial list, such as found in Appendix B.

The Category A use should not have universal application. It is intended to protect those who drink regularly from a water source over a long period of time, such as would occur with a public water supply. It is not like Categories B and C, the fishable/swimmable uses that are applicable throughout the state, because aquatic life (Category B) can be found in all state waters, and all State waters may be used for recreation or fish consumption (Category C). Categories B and C are appropriate statewide uses, as provided in Section 6.1 of the standards, but the Category A public drinking water supply use is not. Presumably, that is why the Board has identified categories B and C as a statewide uses in Section 6.1, and did not mention Category A.

The most reasonable interpretation of the Category A use is also the most consistent with the Category A definition. State waterbodies on which a public water intake is located automatically are

assigned the Category A use. That use must be protected by all upstream dischargers that could interfere with the use. Dischargers many miles upstream will not be interfering with the use, and therefore would not have NPDES limits based on Category A criteria. Those closest to the drinking water intake could demonstrate that discharge levels will not affect the intake. Those dischargers within one half mile would have to meet Category A criteria end-of-pipe, pursuant to Section 7.2.a.B.

The Office of Water Resources has said in the past that Category A should apply everywhere throughout the State because someone might be drawing water out of the stream now or sometime in the future. The effect is to impose significant restrictions on dischargers in order to protect a use that is not known to exist, and may never exist. It is analogous to state denying rural property owners the use of their land, on the grounds that it might be needed for a state park in the future. Such conservatism is simply not necessary – the current standards clearly provide that a public water supply goes in downstream of a wastewater discharge, the upstream dischargers that would interfere with that intake must restrict their operations so as not to interfere with the Category A use.

The importance of making sense of the Category A use can be seen in the changes that the Board is preparing to make with regard to manganese. By deleting the manganese 1 mg/l criterion for Category B, aquatic life, the Board was trying to eliminate the need for manganese removal treatment that is not necessary for protection of aquatic life. Unfortunately, the advantages of deleting the Category B criteria are lost if the same criterion is found in Category A, and Category A applies everywhere throughout the state. If, on the other hand, the Board were to confirm in its response to comments that the Category A manganese criterion only applies where necessary to protect a public water supply, a permittee could make a demonstration to the Office of Water Resources that there is no intake downstream that could be affected by the discharge, and the manganese limit would not be needed. If there was a dispute, the permittee could appeal, and the

Board could determine whether the Category A use, as it has described it, is present. We believe such disputes are unlikely to occur frequently, because there are so few qualifying public water supply systems on any but the largest streams.

Addressing the WVMA's concerns about the Category A use would not require a change in the water quality standards. The Board has defined the Category A use in satisfactory fashion, and there is no need to change that definition. The Board could clarify, though, that protecting the category A use means protecting the water supply intake, not protecting every stream in the state, even low flow and intermittent streams, as public water supplies. The Board could further state that if a public water supply goes in downstream of a wastewater discharge, the upstream dischargers that would interfere with that intake must restrict their operations so as not to interfere with the Category A use. The restrictions might take the form of lower (or new) permit limits, or other means of protecting the use. Until those additional restrictions are needed - until the intakes are proposed for installation or are located in places where they can be affected by a discharge - they should not be imposed indiscriminately.

The approach the WVMA is recommending is simple to apply and consistent with current regulations. It would not require changes to the water quality standards, but would help clarify their intent. It is not contrary to EPA regulations or guidance, and it would protect public water supplies in a manner consistent with the protections provided by neighboring states. We hope the Board will clarify the rule as described above.

III. Specific Comments

A. Natural Conditions As Water Quality Standards

Section 7.2.c.4 presently states that, where water quality is diminished as a result of natural conditions, the natural conditions become the criteria. The Board would add the following

qualification - "Provided, That the existing and designated uses of downstream waters are not adversely affected." While such a proviso might make sense if the lesser quality were due to human activity, it makes no sense if the lesser quality is due to natural conditions. One of the purposes of the water quality standards is to preserve natural quality. If the downstream uses are affected by that natural quality, it is the use designation that should be changed, not the natural quality. It is not even clear from the Board's proposal how the natural quality could be changed to protect the downstream use.

The change is also inconsistent with Section 6.1.b.2, which states that a designated use that is not an existing use can be removed if attaining the use is not feasible due to "naturally-occurring pollutant concentrations." With the Board's proposed change to Section 7.2.c.4, a naturally-occurring concentration of a substance could not be alternative water quality criteria if a downstream use is affected, but that same naturally-occurring concentration could be the basis for removal of the downstream use. In other words, Section 7.2.c.4 suggests that the use should be protected against naturally-occurring substances that are present in concentrations greater than the Board's criteria, while Section 6.1.b.2 implies that the use should be removed where naturally-occurring substances interfere with the use. This has the potential to create confusion as to how naturally-occurring concentrations in excess of criteria are treated under the standards.

By adopting its proposed language the Board would allow a water quality violation to occur solely as a result of natural conditions. The Board should not proceed with the proposed change to Section 7.2.c.4, and should leave the language as it currently stands. The current provision is eminently sensible and easily understood, and needs no improvement.

B. **Dissolved Metals**

The WVMA urges the Board to declare that metals criteria in Appendix E are expressed as dissolved metals, rather than total metals. This is a change the WVMA and others have been urging for years, and it is in accordance with EPA's position on the matter. Our position in this regard was set out fully in our comments during the WVMA's comments during the 1991 and 1994 triennial reviews and in preliminary comments offered March 31, 1997 for purposes of this triennial review. Similar comments have been made by American Electric Power, among others.

The Board's proposed changes do not include a statement that metal criteria are expressed as dissolved metals. However, we understand the Board will assemble a committee for purposes of considering whether to recommend the use of dissolved criteria. The WVMA respectfully requests that it be allowed to nominate a committee member, and that it be permitted to participate in evaluating use and implementation of dissolved metals criteria.

C. **Mixing Zones within a Half Mile of a Public Water Supply**

The Board proposes to further tighten the water quality standards with regard to public water supplies. Currently, the standards prohibit a mixing zone if the zone would overlap a public water supply intake. The new rule (at Section 5.2.h.6) would prohibit a mixing zone from overlapping any area one half mile upstream of the intake. The current protection is sufficient and should be left as is. As long as a mixing zone does not overlap a public water supply intake, the public water supply will be protected by permit limits that prevent exceedances of human health criteria at the intake. The current half mile rule guarantees that any properly sized mixing zone will never come near a public water supply intake. This is a sufficient margin of safety, and should be left as it is.

The exception to the "half mile rule" being urged by Weirton Steel Corporation is very reasonable, given the unusual circumstances presented. We hope the Board will agree and support that narrow exception.

D. Deletion of Category B3

The Board has proposed deletion of the B3 Aquatic Life subcategory on the grounds that the criteria for B3 are the same as the criteria for B1. We agree that the criteria are the same, but would urge the Board to consider the fact that there may be a need for a B3 category in the future if, for example, the Board begins development of sediment criteria. Until that is done, there is no harm to continuing with the B3 designation.

In the alternative, if the Board elects to eliminate the B3 subcategory, we would ask it to note in its comments that it would consider recreating that subcategory in the event that a need for criteria for small streams is established.

E. Deletion of Chronic Criteria for Aluminum

The WVMA commends the Board for removing the chronic criteria for aluminum. We urge the Board to change the acute criterion for aluminum as well, for the reasons that are well expressed in the July 21, 1997 comments of Century Aluminum of West Virginia. EPA's own studies, which have flaws, generated a final acute value for aluminum of 1496 ug/l. To be conservative, EPA halved that figure, to arrive at the acute criterion. Given the already conservative nature of the EPA studies, there was no need to halve the criterion in order to protect aquatic life. We would urge the Board to adopt a revised acute criterion for Category B of no less than 1496 ug/l, pending a further review of the acute aluminum criterion, as suggested by Century Aluminum.

F. **Fecal Coliform**

The current standard is 200 colonies per 100 ml as a monthly geometric mean, based on at least five samples per month, or 400 colonies per 100 ml in more than 10% of the samples taken during the month. The Board is proposing changing the standard so that a violation occurs if there are more than 400 colonies per 100 ml in any sample. We are concerned that the proposed change would result in setting 400 colonies per 100 ml as an absolute limit with no consideration given to the fact that some conditions beyond the control of the discharger can result in occasional higher analytical results that do not contribute to public health problems.

The current water quality standards for fecal coliform recognize that fecal coliform test procedures are subject to anomalies that can result in very high counts. The membrane filter test is subject to false positives when atypical colonies on the growth media are caused by other bacteria such as nitrifiers being present in the sample. In addition, fecal coliform results are very susceptible to contamination during sampling, even though great care is taken to avoid such inadvertent contamination.

On occasion disinfection equipment is either overwhelmed or is temporarily knocked out of service during storm conditions, resulting in abnormally high fecal counts. There are also times when raw river water withdrawn by facilities for process use contains significant levels of fecal coliform. This contamination may then be the source of occasional high fecal coliform counts in discharge samples from these operations. The proposed fecal coliform standard would not recognize these situations and as a result imposes requirements that are overly stringent. Therefore, we urge the Board to leave its current fecal coliform criteria in place.

G. **Iron**

The WVMA believes that iron criteria should be carefully reviewed by the Board, with an eye to revising them. There are significant questions regarding the derivation of the iron criteria that should be considered by the Board. While we do not have a proposal to make at this time, we do not believe this is an issue that should wait until the next triennial review, and urge the Board to consider forming a task force to evaluate the iron criteria and report back to the Board with its recommendations.

H. **Manganese**

We commend the Board for proposing elimination of the 1 mg/l Category B criteria for manganese, given the solid evidence that criteria for manganese are unnecessary to protect the aquatic life use. However, as pointed out in our general comments, the fact that the same criterion applies in Category A waters effectively imposes that limit everywhere the Board determines that Category A applies. Therefore, in order for the elimination of the manganese criteria to have any effect, the Board will have to clarify that the Category A use applies to those streams that are used as qualifying drinking water supplies, not every stream in the state.

I. **Chloroform, Tetrachloroethane, and Phenolics**

The WVMA supports the changes to the criteria for these substances, and believes that they will help to make West Virginia industry more competitive with its national counterparts, without sacrificing protection of human health or the environment. However, as cogently explained in the comments of Weirton Steel Corporation, a change should be made in Section 8.24 to reference phenols, rather than phenolic materials. Phenols is a subgroup of phenolic materials, and it is the substance for which the EPA Gold Book criteria were developed. If the Board means to regulate total phenolic materials using the criteria for phenols, it should explain why it is doing so.

J. Fish Body Burden Criteria

The WVMA supports the elimination of body burden criteria for certain organics, presently found at Section 8.22.2. While the establishment of body burden criteria was an understandable attempt to provide a surrogate measurement of substances for which criteria are set below quantification levels, it was never clear how those criteria should be applied. For example, the mobile nature of fish make determining the location of the violation an impossibility, and no definitive guidance was provided as to whether the body burden limit applied to the fish as a whole, edible fillets, or otherwise, and whether it was an average figure or a single fish figure.

We believe that the best course for the Board to follow is simply deletion of Section 8.22.2, rather than approving methods of calculating ambient water column concentrations from fish tissue, as the Board has proposed in Section 8.5. We are concerned that there are still sufficient unanswered questions about fish sampling, fish residency patterns, and other factors that leave unclear where and if a violation of water quality standards has occurred. Similar problems are presented by semi-permeable membranes - different results will be obtained depending on how full the membrane is, what the membrane is made of, how long it is in place, etc. Furthermore, we are not aware of any accepted procedure that shows consistent back-calculation results for semi-permeable membranes. EPA is investigating some promising techniques, but they are still experimental, and EPA has expressed reservations about their use.

Another problem presented by the Board's approval of multiple means of determining compliance with below-detection criteria is the possibility of conflicting results. In the event that fish testing and high volume sampling provide different results, one lower and one higher than the criteria, which will be considered "correct"?

For these and other reasons, we support adoption of direct measurement techniques, such as high volume sampling, once they are shown to be reliable. We believe the experiences of EPA, ORSANCO and other agencies will be helpful in demonstrating the circumstances under which high volume sampling are most accurate and useful. The Board should wait until a direct measurement method such as high volume sampling is approved by EPA, and then use that method to quantify substances that are presently unquantifiable using current techniques. Until then, the risk of incorrect results is too great to justify use of the methods suggested by the Board.

The WVMA's concerns were set out more fully by Paul Anderson, our representative to the Board's Committee considering the fish body burden criteria. We would ask that the statements in his May 22, 1997 letter to Elizabeth Chatfield, and his other letters and memoranda to the committee, be considered with the foregoing comments.

IV. Conclusion

We appreciate the opportunity to offer these comments and hope that they will be given your careful consideration. If you should have any questions about the comments we will be happy to discuss them further.

Respectfully submitted this July 22, 1997.

WEST VIRGINIA MANUFACTURERS ASSOCIATION

Robert L Foster DLY

Robert L. Foster

Prepared by:

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July 23, 1997

Libby Chatfield
West Virginia Environmental Quality Board
1615 Washington St. E.
Charleston, WV 25311

Dear Mrs. Chatfield:

I was pleased to see that the Water Quality Board's proposed revision to the fecal coliform standard conforms closely to my suggested change. The modification will bring the standard into line with existing WV NPDES practice by stating that any count >400/100 ml is a violation. It will also allow realistic and timely assessments of water quality problems due to fecal contamination in surface waters

Sincerely,

W. Neil Gillies
Science Director

Fax copy sent 7/23/97

DIVISION OF ENVIRONMENTAL PROTECTION
1201 Greenbrier Street
Charleston, WV 25311-1088

CECIL H. UNDERWOOD
GOVERNOR

JOHN E. CAFFREY
COMMISSIONER

TO: Libby Chatfield, Technical Adviser, EQB

FROM: Jerry L. Ray, Assistant Chief, Permits

RE: Proposed Amendments to 46CSR1

DATE: July 21, 1997

We respectfully submit the attached comments regarding the proposed amendments by the Environmental Quality Board to Title 46, Series I, "Requirements Governing Water Quality Standards."

JLR/gjs

Attachment

cc: Barbara S. Taylor
Randolph M. Sovic

DIVISION OF ENVIRONMENTAL PROTECTION
OFFICE OF WATER RESOURCES

INTER-OFFICE MEMORANDUM

TO: Jerry Ray **DATE:** July 14, 1997

FROM: Randy Sovic **SUBJECT:** Proposed EQB Rule changes to 46CSR1

The following responses on issues are recommended to be forwarded to the EQB in response to the proposed changes to 46CSR1 currently in notice. Note that these responses are based upon the document forwarded to the Office of Secretary of State with EQB letter dated 6/18/97.

Section 2.11.b. - Support the proposal.

Addition under Section 2 - Suggest the following language as a definition for 'perennial stream': Perennial streams are streams which flow during sustained periods of no precipitation and which support aquatic life whose life history requires residence in flowing waters for a continuous period of at least six (6) months.

Section 4.1.b.1. - Result of my previous 3/19/97 comments, therefore, support change.

Section 5.2.h.6. - Result of 3/19/97 comments, therefore, support additions.

Section 6.3.a. - Neither particularly support or object to the proposed change as OWR has always considered warm water criteria to apply to all streams (other than trout waters or wet weather) regardless of the size or flow patterns. For better clarification, however, would tend to agree that only one category is necessary, therefore would offer the following clarifying language if B.3. is eliminated: Stream or stream segments which contain populations of aquatic life composed and which support the propagation of warm water species.

Section 6.3.b. - Result of previous comment, therefore, support.

Section 6.3.c. - See comment to 6.3.a.

Section 6.3.d. - Result of previous comment, therefore, support.

Section 7.2.c.4. - The proposed language does not address OWR concerns over what is, in effect, a standards setting process. As a result the EQB is still urged to develop an acceptable protocol for this process. To this end, OWR would be willing to participate in any group forum to be established by the EQB.

Section 7.2.d.2.A. - Concur with this elimination.

Section 7.2.d.6.1. - Reference to 316A should be 316(a) and the date specified is apparently incorrect (1997 should be 1998). Otherwise support the proposal.

Section 7.2.d.7.2. - Concur with proposed elimination.

Section 7.2.d.8. - Do not object to the proposal.

Section 7.2.d.16.1. - Concur with the proposal to delete the arsenic exception. However, should the EQB's additional proposal to eliminate Section 8.15.1 result, questions must be resolved regarding any future applicability of the 3.5 ug/l Iron exception this section.

Section 7.2.d.16.3 - Concur with proposed deletion.

Section 7.2.d.20.2. - Concur with proposed deletion. In addition, however, should Section 6.3.c. be eliminated, EQB will need to remove the reference to Water Use Category B.3.

Section 7.2.d.20.3. - Concur with proposed deletion.

Section 7.2.d.20.4. - See comments to 7.2.d.6.1.

Section 7.2.d.29.1. - Understand that OMR is in agreement to delete this exception, therefore, defer comment to OMR.

Section 7.2.d.30.1. - Concur with proposal to delete.

Section 8.1.a. - Result of 3/19/97 comments, therefore, concur with change.

Section 8.2.c. - Result of 3/19/97 comments, therefore, concur with change.

Section 8.5. - Result of committee recommendations of which OWR had representation, therefore, understand in concurrence with proposal. For clarification, however, suggest the following corrections:

(a) Add the word "the" in 8.5.a. preceding the word following.

(b) Correct wording in 8.5.b.B from "meets" to "meeting" and revise 303D to 303(d).

(c) Relocate 8.5.c.A.ii. to 8.5.c.B. as this is an indirect vs direct measurement method.

Appendix E:

Section 8.1. - Accept the temporary relaxation. However, the proposed addition appears in error and therefore presuming the need of such reference to be incorporated (see comments on 7.2.c. & 8.1 of 3/19/97) it will need to be corrected to 7.2.d.2.B. Note to also refer to my 6/16/97 E-mail (Issue #7) regarding what OWR will need to pursue in the ongoing permitting process to handle the Acute issue.

Section 8.12. - Support the changes.

Section 8.15.1. - Support the proposed elimination, however, again note that the EQB may need to further address the impact of this elimination will have on Section 7.2.d.16.1.

Section 8.17 - Have not had sufficient time to research the impact of the elimination of the Aquatic Life Use (B) values as no criteria document on this parameter could be located. Until such effort is undertaken we should defer comment to the OMR. Note, however, that the corresponding value for Category A is still applicable and should therefore still be applicable to any mining operation unless this 'A' category use exception is pursued or OWR/OMR have the latitude suggested in Section 6.1 of my 3/19/97 comments.

Section 8.17.1. - See comment on 8.17.

Section 8.22.:

Aldrin - Although I am unaware of the specific rationale for the proposed elimination, it is presumed that the values were overcites as current EPA 40 CFR 131.36 has no values established and a brief review of the Criteria Document (EPA 440/5-80-019 - Oct. 1980) suggests that no data were available at the time. Since the document is somewhat dated, if not already pursued, the EQB should research if more current data exists to now suggest a chronic value. Further note that the Acute values listed in 46CSR1 also appear in error as both the old criteria document and 40CFR 131 stipulate the values as ug/l vs ng/l, hence the EQB may wish to evaluate if an overcite in the listing of the acute values has also occurred.

Chloroform - A brief review of the criteria document (EPA 440/5-80-33-Oct.1980) reveals that the 15.7 ug/l levels proposed for revision were apparently human health criteria based upon consumption of aquatic organisms only, hence it appears that these levels are likely inappropriate. However, although the values now proposed appear as the lowest values generated taken from the 1980 criteria document data, other references in the document pose questions relating to these values.

As an example of these questions, although pg. vi and pg. B-3 of the document summarizing the criteria suggests the 28,000 ug/l level, it goes on to read "and would occur at lower concentrations among species that are more sensitive than the three tested species." Pg. B-4 then offers that "No final Acute Values are calculable since the minimum data base requirements are not met." Presumably based upon this limited data is why no aquatic life criteria have been established in 40CFR131.36. Similar questions are noted regarding the chronic value suggested on the referenced pgs. As a result, if the EQB chooses to establish aquatic life values for this parameter, although the listed values afford some measure of control beyond no specified value, the OWR would urge again, unless this has already been pursued, that the EQB revisit these proposed criteria and offer sound rationale for their implementation.

1,1,2,2 - tetrachloroethane - See comments on chloroform. Refer to pgs. vi, vii, viii, B-5, B-6, and B-10 of EPA 440/5-80-029-Oct. 1980 Criteria Document.

Additional comments on Section 8.22. - Although not proposed by the EQB, the OWR should urge a detailed evaluation of other priority pollutants, particularly those where no State criteria exists and there are published EPA criteria as well as instances where published criteria are more stringent than existing state criteria.

A cursory review of 40CFR131.36 reveals the following parameters with published human health criteria where no state criteria exists.

Asbestos
Acrolein
2-4-Dichlorophenol

2-4-Dimtrophenol
Pentachlorophenol
Phenol
2,4,6 Trichlorophenol
Benzidine
Bis (2-chloroethyl) Ether
Bis (2-chlorisopropyl) Ether
3,3'-Dichlorobenzidine
1,2-Diphenylhydrazine
Hexachlorobutadiene
Heachlorocyclopentadiene
Hexachloroethane
Nitrobenzene
N-Nitrosodimethylamine
N-Nitrosodiphenylamine
4-4'-DDE
4-4'-DDD
Alpha-Endosulfan
beta-Endosulfan
Endosulfan Sulfate
Endrin Aldehyde
Heptachlor Epoxide

The review of metals in Section 8. also reveals the following more restrictive federal criteria:

Aquatic Life	Human Health
Chromium III	Arsenic
Chromium VI	
Mercury (CMC)	

Section 8.22.1. & 8.22.2. - Concur to delete predicated on comments relating to new Section 8.5.

Section 8.24 - Need to object to the proposed aquatic life values as these values are those promulgated for the individual compound phenol (Re: EPA 440/5-80-066-Oct. 1980). Phenolic materials (or phenols) is a compilation of various phenolic compounds including chlorinated and non chlorinated priority or non priority pollutants as well as 'phenol'. Use of the criteria for phenol as a level for phenolic materials is therefore inappropriate.

Section 8.31. - Concur with the proposal.

Section 8.33. - Concur with the proposal, however, the EQB may want to investigate an alternate value for Human Health protection possibly based on at least organoleptic data. As an example, EPA 440/5-88/019-Sept. 1988 Criteria Summary suggested a value of 5 mg/l. Still other values may be appropriate, however time has not allowed for any detailed review on this issue.

Section 8.33.1. & 8.33.2. - Concur with necessary changes, however, will also now be necessary to add the word 'Zinc' to new 8.33.

Other applicable issues raised in comments dated 3/19/97 are yet being undertaken by Libby Chatfield for further EQB consideration.

In relation to the Weirton Steel exemption of drinking water intake for the 1/2 mile rule, I understand Naresh has already prepared comments to Libby Chatfield on the issues.

Note we need to have comments prepared and forwarded to the EQB prior to 7/23 as Libby advised comments can be received two (2) days past the end of the PN period, however, I'd prefer to attempt to have these prepared prior to the Public Hearing of 7/21.

RS/pah

cc: Barbara Taylor
Permits Staff

Innsbrook Technical Center
5000 Dominion Boulevard
Glen Allen, Virginia 23060

July 21, 1997

VIRGINIA POWER

Mr. Charles R. Jenkins
Chairman
Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia, 25311

RE: COMMENTS CONCERNING WEST VIRGINIA'S PROPOSED WATER QUALITY STANDARDS REGULATION, 46 CSR 1

Dear Chairman Jenkins:

Virginia Power is pleased to provide you with the attached comments on West Virginia's proposed *Requirements Governing Water Quality Standards,* 46 CSR 1.

The geology and geography of West Virginia are such that there is great diversity in the physicochemical characteristics of the various waterbodies throughout the state. Similarly, the physicochemical characteristics of industrial and municipal discharges to West Virginia surface waters also vary considerably depending on the nature of the operations contributing flows.

Virginia Power strongly supports the development of water quality standards that are protective, reasonable, and based in science. In light of the above, this can only be accomplished through regulatory language and implementation procedures that allow for the use of site-specific information to develop reasonable assumptions concerning the potential for adverse impact to human health and/or the environment. This sentiment is reflected in many of our comments on the proposed regulation.

We trust that you will give these comments serious consideration.

Sincerely,

A. W. Hadder

A.W. Hadder
Manager
Environmental Policy and Compliance

Virginia Power's Comments on Proposed Revisions to 46 CSR 1
Requirements Governing Water Quality Standards

1. **Mixing Zones for Human Health Criteria Should be Allowed in Streams with 7Q10 Flow Values Less Than or Equal to 5 cfs.**

According to §5.2.c., no mixing zone for human health criteria shall be established on a stream which has a seven (7) day ten (10) year return frequency (7Q10) of 5 cfs (3.23 mgd) or less. This provision is disturbing for the following reasons:

- **5 cfs is a considerable amount of flow,** which can provide substantial assimilative capacity depending on the volume of the effluent discharged or other site-specific factors that affect mixing characteristics.

- **Existing data indicate that there are a substantial number of West Virginia streams in which mixing zones would be needlessly prohibited.** In 1989, the United States Department of the Interior Geological Survey (USGS), in cooperation with the West Virginia Department of Natural Resources Division of Water Resources, published *Low-Flow Characteristics of Streams in West Virginia* (Water-Resources Investigations Report 88-4072). Table 1. of this report (attached) presents the 7Q10 values determined for 98 stream monitoring locations meeting the following criteria: drainage area less than 1000 square miles; more than 5 years of continuous data; not influenced by a regulated flow from a dam or other surface impoundment. Of the 98 stream locations in Table 1., 67 (or ~ 68%) had 7Q10 flows of less than or equal to 4.9 cfs, and 29 (or ~30%) had 7Q10 flows greater than 1 cfs but less than 4.9 cfs (see Figure 1. attached).

- **The prohibition is not technically justifiable.** A mixing zone for human health protection established on a stream with a 7Q10 of 5 cfs or less should be as protective as one established on a stream with a 7Q10 of 100 cfs. As long as both mixing zones are "sized to protect human health" and are developed using "reasonable assumptions about exposure pathways" each should be equally protective.

Based on the above, Virginia Power recommends that the EQB allow for mixing zones for human health criteria in streams with 7Q10 flows less than or equal to 5 cfs by deleting the last sentence of §5.2.c. from the Water Quality Standards regulation.

2. **Site-specific Mixing Zones Should be Allowed For Discharges to Lakes and Surface Impoundments.**

According to §5.2.f. "In lakes and other surface impoundments, the volume of a mixing zone shall not affect in excess of ten (10) percent of the volume of that portion of the receiving water available for mixing." This is a rigid requirement that does not allow for site-specific mixing zone determinations. It does not consider that discharges to lakes or surface impoundments will differ on a site-by-site basis (e.g., different flows or the use of diffusers versus bank discharges), or that the characteristics of lakes and impoundments (e.g., water depth or flow-through volume) also vary considerably and may profoundly impact the amount of assimilative capacity at a given site for a particular discharge.

In light of the above, Virginia Power recommends that §46-1-5. *Mixing Zones* be revised to allow for the development of site-specific mixing zones for discharges to lakes. This can be easily accomplished by revising §5.2.j. as follows:

> 5.2.j. The Chief may waive the requirements of subsection (e), (f), and (h) above if a discharger provides an acceptable demonstration of:

3. **The Harmonic Mean and 30Q5 Stream Flows Should be Used as the Design Flows with the Human Health Criteria for Carcinogens and Noncarcinogens, Respectively.**

Section 7.2.b. sets the critical stream flow for establishing mixing zones for all pollutants as the 7Q10. The EPA, however, clearly recommends the harmonic mean and the 30Q5 as design flows for use with the human health criteria for carcinogens and non-carcinogens, respectively (*Water Quality Standards Handbook: Second Edition*, EPA-823-B-94-005a, August 1994, p. 5-11). The EPA's rationale for use of the higher stream flows with the human health criteria is that these criteria were developed assuming that human health effects "occur because of a long-term exposure to low concentration of a pollutant (for example, 2 liters of water per day for 70 years)". This is quite different from aquatic life criteria, which are generally developed using toxicity tests of relatively short duration, and are generally applied using stream flows that occur over shorter time intervals (i.e., 1Q10 or 7Q10).

According to the *Technical Support Document for Water Quality-based Toxics Control* (pp. 88-89), the EPA determined the following characteristics for 60 streams selected at random from throughout the United States: the long-term harmonic mean flows for all 60 streams were equal to or greater than two times the 7Q10; fifty-four of the streams had harmonic mean flows equal to or greater than 2.5 times their 7Q10 flows; and 40 of the 60 streams had harmonic mean flows greater than or equal to 3.5 times the 7Q10. Using data for the same 60 streams, the EPA determined that the 30Q5 flow

was 1.1 to 1.4 times the 7Q10, depending on the stream. Clearly, the use of the 7Q10 for application of human health criteria is extremely conservative, especially for carcinogens, or noncarcinogens where the effects are manifested after a lifetime of exposure.

Based on the above, the use of an average stream flow, such as the harmonic mean or 30Q5, is the logical choice for application of human health criteria. Consequently, Virginia Power supports the use of these stream flows in establishing mixing zones for human health criteria, and we recommend that §7.2.b. be modified to recognize the harmonic mean and 30Q5 stream flows for application of the human health criteria for carcinogens and non-carcinogens, respectively.

4. **The Environmental Quality Board Should Adopt Numeric Water Quality Criteria for Dissolved Metals. In the Interim, the EQB Should Postpone the Effective Date of Water Quality-Based Effluent Limitations Established Using Total Recoverable Metals Data.**

Virginia Power supports the Board's decision to establish a committee of interested parties to evaluate the use of dissolved versus total recoverable criteria for metals. It is our opinion that the available information clearly supports the use of dissolved metals criteria, and that West Virginia will ultimately reach a similar conclusion. The basis for our opinion is outlined in our *Discussion of Issues* below.

While we are pleased with the Board's decision to study the dissolved versus total recoverable issue, we are concerned that many permittees may be needlessly penalized during the evaluation period. As we understand it, the committee will have until March 15, 1998 to provide a recommendation to the Board. Should the committee decide, as we believe they will, that the criteria for metals should be expressed as dissolved, then the regulation will require modification and public notice to include the new standards. Consequently, it may be two or more years before dissolved metals criteria are finally included in the Water Quality Standards regulation. In the interim, the Board will be including water quality-based effluent limits for metals in NPDES permits based on an evaluation of total recoverable metals data. Should the Board ultimately adopt dissolved metals criteria, many of these limits may be determined to be extremely conservative, or even unnecessary, based on a measure of dissolved metals. Therefore, Virginia Power recommends that the EQB postpone the effective date of all water quality-based effluent limits for metals until the Board has made a final decision concerning the dissolved versus total recoverable metals issue. This may be accomplished through the inclusion of a three-year compliance schedule in NPDES

permits that are issued with metals limits. Should the Board adopt dissolved metals criteria within the three-year compliance period, the permit could be modified to change or remove the effluent limitation(s), as appropriate.

Discussion of Issues

It has been EPA's policy since October 1993 that "the use of dissolved metal to set and measure compliance with water quality standards is the recommended approach, because dissolved metal more closely approximates the bioavailable fraction of metal in the water column than does total recoverable metal." (*Office of Water Policy and Technical Guidance on Interpretation and Implementation of Aquatic Life Metals Criteria*, October 1993). This policy is repeated in the Section 3.6 *Policy on Aquatic Life Criteria for Metals* of the EPA's *Water Quality Standards Handbook: Second Edition*, EPA-823-B-94-005a, August 1994, p. 3-34). Both documents state that "this conclusion regarding metals bioavailability is supported by a majority of the scientific community within and outside the Agency."

The toxicity tests used to develop the majority of the existing total metals criteria were performed using test solutions in which the ratio of dissolved to total recoverable metal was approximately 1. In the environment this is often not the case, and there may be considerably more total recoverable metal than dissolved metal. In such situations a measurement of total recoverable metal provides an overly conservative estimate of the potential for water column toxicity because it does not accurately reflect the bioavailability of the metal.

One argument that is often made against the use of dissolved metals criteria is that there must be some translator to account for the amount of total recoverable metal that was present in the toxicity tests used to derive the national aquatic life criteria for metals. This concern led the EPA to develop translators that may be applied to existing total recoverable criteria in order to convert the criteria to the dissolved form. These conversion factors may be found in the interim National Toxics Rule of May 4, 1995, at 60 FR 22220.

A second, and frequently expressed, argument against the use of dissolved metals criteria is that they do not consider the accumulation of the metal in the sediments or in aquatic organisms. The EPA recognizes this concern in their detailed discussion of *Dissolved vs. Total Recoverable Metal* on pages 3-34 and 3-35 of their *Water Quality Standards Handbook: Second Edition.* In this discussion the EPA recognizes that "[t]he ambient water quality criteria are neither designed nor intended to protect sediments, or to prevent effects in the food webs containing sediment dwelling organisms." The EPA also recognizes that the use of total recoverable standards would be more conservative if one is considering the risk to sediment and food chain effects. However, the degree of conservatism inherent in the total recoverable approach is unknown because a consideration of sediment impacts is not incorporated into the criteria

development methodology. While dissolved metals standards probably provide the best indication of the potential for water column toxicity, total recoverable measurements of the ambient water column may provide an indication of the potential for ecosystem stress, "particularly in locations other than in the water column (e.g., in the sediments)."

A third rationale for not adopting dissolved water quality standards is that the NPDES permit regulation requires the development of total recoverable effluent limitations. Consequently, some form of translator must be used to convert dissolved metals criteria to total recoverable permit limits. Just over a year ago, the EPA released a detailed guidance document entitled *The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion* (EPA 823-B-96-007). This document provides an in-depth discussion of procedures that may be used to determine dissolved-to-total recoverable translator values.

In conclusion, the use of dissolved metals criteria is recommended by EPA, and is clearly in keeping with the criteria development methodology on which the existing aquatic life criteria are based. In addition, the EPA has developed total recoverable to dissolved translators that may be used to convert the existing total recoverable criteria to dissolved criteria, and there is now detailed guidance on how to develop a total recoverable permit limit that will be protective of a dissolved water quality standard. Consequently, the only remaining rationale for maintaining the existing total recoverable criteria is that they are conservative; however, the degree of conservatism is clearly unknown, and the loss of conservatism may be compensated for through the use of ambient assessments.

5. **Mixing Zones Should be Allowed for Category A Pollutants Within the Area ½ Mile Above a Public Water Supply.**

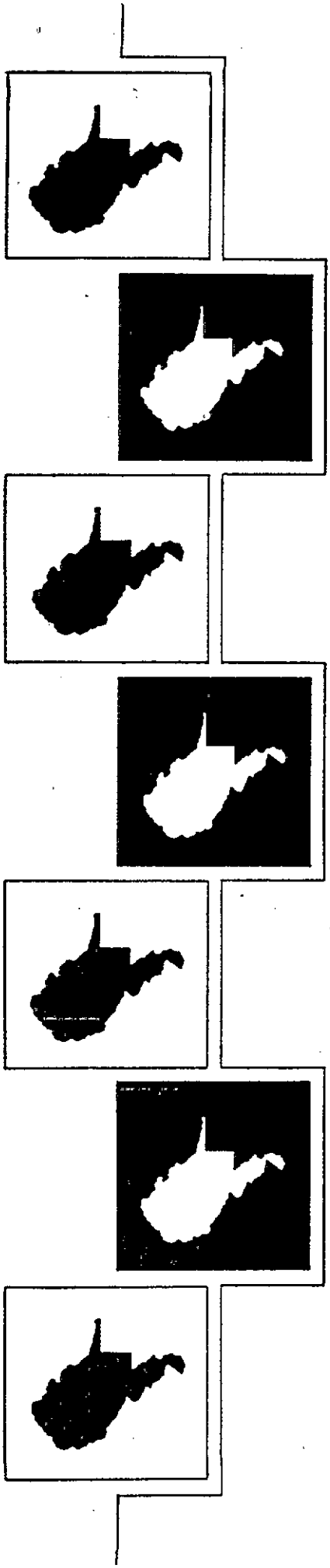
Section 7.2.a.2. prohibits mixing zones for Category A pollutants within the area ½ mile above a public water supply. Virginia Power understands the need to protect public drinking water supplies and supports all reasonable efforts to maintain safe drinking water. However, the ½ mile rule, while a convenient regulatory tool, is not a reasonable approach to water quality-based permitting, and may cause industries and municipalities to expend significant resources to reduce effluent pollutant concentrations with no benefit to human health. This condition ignores the fact that site-specific mixing conditions determine the assimilative capacity of a particular stream for a particular discharge pollutant.

It is our belief that the regulation contains language that in the absence of §7.2.a.2. will provide more than adequate protection for drinking water supplies. For example, §5.2.g. states that mixing zones "shall be limited to an area or volume which will not adversely alter the existing or designated uses of the receiving water, nor be so large as to adversely affect the integrity of the water body." In addition, §5.2.c. states that mixing zones for human health criteria "shall be sized to prevent significant

human health risks and shall be developed using reasonable assumptions about exposure pathways." A third section, §5.2.a., states that the chief will assign, on a case-by-case basis, definable geometric limits for mixing zones. This section could be expanded to further recognize the need to consider the proximity of a mixing zone to a public water supply intake by modifying it as follows:

> Applicable limits shall include, but may not be limited to, the linear distances from the point of discharge, surface area involvement, volume of receiving water, and shall take into account other nearby mixing zones and the proximity of the discharge to a public water supply intake.

In light of the above, Virginia Power recommends that the Board delete §7.2.a.2. of the regulation.



Water-Resources Investigations
Report 88-4072

Low-Flow Characteristics of Streams in West Virginia

PREPARED BY
United States Department of the Interior
Geological Survey

IN COOPERATION WITH THE
West Virginia Department of Natural Resources
Division of Water Resources

Table 1.-Summary of basin and flow characteristics for selected continuous-record stream-gaging stations
[All stations in West Virginia unless noted; mi^2, square miles; ft^3/s, cubic feet per second; Md,n, low-flow characteristic; annual minimum "d"-day mean discharge for "n"-year recurrence interval; R, streamflow recession index in days per log cycle; V, streamflow variability index; P, average annual precipitation; Rgn, hydrologic region from Figure 2]

Map No.	Station number	Station name	Period of record	Hydro-logic unit	Drainage area (mi2)	Average discharge (ft3/s)	M7,2 (ft3/s)	M7,10 (ft3/s)	Elev (feet)	R	V	P (inches)	Rgn
001	01595000	North Branch Potomac River at Steyer, Md.	1956-83	02070002	73.0	172	10.7	4.2	2450	7	0.580	55	2
002	01595300	Abram Creek at Oakmont	1957-82	do	47.3	68.1	2.45	0.457	2670	15	0.560	38	2
003	01599500	New Creek near Keyser	1948-83	do	45.7	44.7	2.15	1.02	1830	10	0.574	38	2
004a	01604500	Patterson Creek near Headsville	1939-83	do	219	166	6.82	2.89	1280	30	0.565	37	2
005a	01605500	South Branch Potomac River at Franklin	1940-69, 1977-83	02070001	182	165	27.0	18.3	2940	82	0.379	41	2
006	01605600	Friends Run near Franklin	1969-77	do	4.55	3.56	0.056	0	3200	25	0.726	41	2
007	01606000	North Fork South Branch Potomac River at Cabins	1940-61, 1979-80	do	314	399	17.9	7.29	3120	34	0.536	40	2
008a	01606500	South Branch Potomac River near Petersburg	1929-83	do	642	709	77.6	52	2910	82	0.433	40	2
009a	01607500	South Fork South Branch Potomac River at Brandywine	1944-83	do	102	99.4	5.17	2.32	2470	37	0.522	41	2
010	01608000	South Fork South Branch Potomac River near Moorefield	1929-35, 1939-83	do	283	218	16.1	8.46	2180	35	0.477	40	2
011	01608050	Fort Run near Moorefield	1970-77	do	4.92	4.70	0	0	1900	14	0.872	37	2
012	01610500	Cacapon River at Yellow Spring	1940-51	02070003	306	257	27.4	21.3	2040	48	0.436	40	2
013	01611500	Cacapon River near Great Cacapon	1924-83	do	677	587	55.1	37.7	1700	54	0.463	41	2
014	01614000	Back Creek near Jones Springs	1939-75	02070004	243	198	8.46	3.73	890	31	0.570	39	2
015	01616500	Opequon Creek near Martinsburg	1948-83	do	272	227	52.6	34.1	630	84	0.320	40	2
016	01617000	Tuscarora Creek above Martinsburg	1949-63, 1968-77	do	11.3	11.1	2.36	1.05	740	240	0.380	37	2
017	03050000	Tygart Valley River near Dailey	1916-75	05020001	187	349	8.50	1.60	3110	22	0.582	60	2
018a	03050500	Tygart Valley River near Elkins	1945-83	do	272	510	13.9	1.69	2940	18	0.577	58	2
019a	03051000	Tygart Valley River at Belington	1908-83	do	408	810	25.4	4.81	2690	14	0.596	56	2
020	03051500	Middle Fork at Midvale	1916-42	do	122	281	6.30	1.20	2600	14	0.567	57	2
021	03052000	Middle Fork at Audra	1942-79	do	149	347	6.20	.900	2480	21	0.607	56	2
022a	03052500	Sand Run near Buckhannon	1947-83	do	14.5	26.8	.031	.8	1870	13	0.642	54	2
023a	03053500	Buckhannon River at Hall	1916-83	do	277	596	16.8	3.02	2110	25	0.558	56	2
024a	03058000	West Fork River at Brownsville	1947-83	05020002	102	167	2.09	.339	1340	20	0.718	49	1
025	03058500	West Fork River at Butcherville	1916-83	do	181	302	3.25	.649	1340	15	0.694	50	1
026	03059500	Elk Creek at Quiet Dell	1944-70	do	84.6	118	2.40	.600	1350	13	0.618	51	1
027	03060500	Salem Fork at Salem	1952-69	do	8.32	10.7	.041	0	1220	5	0.988	46	1
028	03061000	West Fork River at Enterprise	1908-16, 1933-83	do	759	1157	2.6	15.2	1260	13	0.577	49	1
029a	03061500	Buffalo Creek at Barrackville	1916-23, 1933-83	05020003	115	170	3.03	.792	1300	11	0.660	46	1
030a	03062400	Cobun Creek at Morgantown	1966-83	do	10.9	17.1	.083	0	1420	10	0.732	49	1
031	03062500	Deckers Creek at Morgantown	1947-69	do	63.2	99.0	2.60	1.03	1770	19	0.605	52	1
032	03063600	Horsecamp Run at Harman	1970-77	05020004	6.57	9.99	.216	.057	3230	13	0.599	38	2
033a	03065000	Dry Fork at Hendricks	1941-83	do	345	765	33.7	11.5	3310	20	0.500	45	2
034a	03066000	Blackwater River at Davis	1922-83	do	86.2	198	11.8	4.99	3250	20	0.430	49	2
035	03068000	Shavers Fork at Bemis	1923-25, 1974-79	do	73.0	172	26.4	15.4	3700	21	0.403	53	2

Table 1.-Summary of basin and flow characteristics for selected continuous-record stream-gaging stations--Cont.

[All stations in West Virginia unless noted; mi^2, square miles; ft^3/s, cubic feet per second; Md,n, low-flow characteristic; annual minimum "d"-day mean discharge for "n"-year recurrence interval; R, streamflow recession index in days per log cycle; V, streamflow variability index; P, average annual precipitation; Rgn, hydrologic region from Figure 2]

Map No.	Station number	Station name	Period of record	Hydrologic unit	Drainage area (mi2)	Average discharge (ft3/s)	M7,2 (ft3/s)	M7,10 (ft3/s)	Elev (feet)	R	V	P (inches)	Rgn
036	03068610	Taylor Run at Bowden	1974-82	do	5.06	15.3	.950	.440	3250	20	0.430	52	2
037	03068800	Shavers Fork below Bowden	1974-81	do	151	436	38.6	25.4	3500	22	0.382	54	2
038	03069000	Shavers Fork at Parsons	1911-26, 1941-83	do	214	551	37.2	11.1	3300	22	0.440	53	2
039	03069880	Buffalo Creek near Rowlesburg	1968-77	do	12.2	30.1	.407	.135	2290	18	0.560	55	2
040a	03070500	Big Sandy Creek at Rockville	1910-17, 1922-83	do	200	419	12.3	~~24.2~~ 8.4	2070	18	0.593	51	2
041a	03112000	Wheeling Creek at Elm Grove	1941-83	05030106	282	337	3.64	.643	1230	17	0.698	40	1
042	03113700	Little Grave Creek near Glendale	1970-77	do	4.97	6.50	.122	0	1200	13	0.584	43	1
043a	03114500	Middle Island Creek at Little	1929-83	05030201	458	663	4.30	.501	1060	12	0.748	45	1
044	03114650	Buffalo Run near Little	1970-77	do	4.21	5.86	.082	0	900	12	0.671	44	1
045a	03151400	Little Kanawha River near Wildcat	1975-83	05030203	112	233	5.30	2.70	1700	21	0.562	52	1
046	03151500	Little Kanawha River near Burnsville	1938-74	do	155	282	3.60	.500	1500	12	0.675	51	1
047	03152200	Buck Run near Leopold	1970-77	do	2.91	4.25	.027	.007	1090	8	0.740	45	1
048	03152500	Leading Creek near Glenville	1938-51	do	144	220	1.60	.200	1050	12	0.699	44	1
049	03153000	Steer Creek near Grantsville	1938-75	do	166	221	1.79	0	1110	12	0.810	44	1
050	03154000	West Fork Little Kanawha River at Rocksdale	1929-31, 1938-75	do	205	258	1.40	.200	1030	13	0.808	44	1
051	03154250	Tanner Run at Spencer	1970-77	do	2.82	3.96	.022	0	880	9	0.742	44	1
052	03154500	Reedy Creek near Reedy	1952-78	do	79.4	95.3	.314	0	910	12	0.853	44	1
053a	03155500	Hughes River at Cisko	1929-31, 1939-83	do	452	585	5.08	.735	990	15	0.752	44	1
054	03177000	Rich Creek near Peterstown	1942-50	05050002	50.6	36.8	2.70	1.90	2400	30	0.490	42	2
055	03177500	Indian Creek at Indian Mills	1942-50	do	189	128	6.40	3.00	2310	27	0.532	40	2
056	03178000	Bluestone River near Spanishburg	1945-52	do	199	218	17.0	7.90	2600	29	0.479	42	2
057	03178500	Camp Creek near Camp Creek	1947-71	do	32.0	43.3	.271	0	2710	8	0.772	49	2
058a	03179000	Bluestone River near Pipestem	1951-83	do	394	473	26.1	13.3	2570	37	0.522	45	2
059	03179500	Bluestone River at Lilly	1909-16, 1930-47	do	438	472	18.8	7.90	2560	31	0.568	45	2
060a	03180500	Greenbrier River at Durbin	1944-83	05050003	133	257	10.0	2.32	3620	22	0.535	44	2
061	03181200	Indian Draft near Marlinton	1969-77	do	3.06	5.37	.271	0	3240	28	0.636	43	2
062	03181500	Greenbrier River at Marlinton	1910-16	do	408	770	31.7	15.3	3200	20	0.525	43	2
063	03182000	Knapp Creek at Marlinton	1946-58	do	108	149	10.0	4.10	2910	21	0.514	42	2
064	03182500	Greenbrier River at Buckeye	1930-83	do	540	872	33.208	13.9	3180	18	0.549	43	2
065	03182700	Anthony Creek near Anthony	1972-82	do	137	216	9.20	6.40	2480	33	0.535	40	2
066	03182950	Howard Creek at Caldwell	1972-78	do	84.4	123	8.20	5.70	2340	32	0.477	39	2
067	03183000	Second Creek near Second Creek	1946-73	do	80.8	78.7	4.80	3.30	2630	30	0.524	38	2
068a	03185000	Piney Creek at Raleigh	1952-82	05050004	52.2	61.9	2.48	.698	2570	22	0.550	47	2
069a	03186500	Williams River at Dyer	1930-83	05050005	128	332	9.44	2.29	3410	18	0.542	60	2
070	03187000	Gauley River at Camden on Gauley	1910-16, 1930-75	do	236	576	19.5	3.92	3180	23	0.541	59	2
071	03187300	North Fork Cranberry River near Hillsboro	1969-82	do	9.78	31.5	1.97	1.12	3950	18	0.408	57	2
072a	03187500	Cranberry River near Richwood	1945-51, 1965-82	do	81.2	239	9.13	2.86	3270	18	0.486	60	2
073	03188500	Cherry River at Richwood	1909-16	do	85.0	235	14.8	7.34	3400	18	0.440	57	2
074	03189000	Cherry River at Fenwick	1930-69, 1979-82	do	150	412	7.38	1.44	3320	18	0.624	56	2

Table 1.-Summary of basin and flow characteristics for selected continuous-record stream-gaging stations--Cont.

[All stations in West Virginia unless noted; mi^2, square miles; ft^3/s, cubic feet per second; Md,n, low-flow characteristic; annual minimum "d"-day mean discharge for "n"-year recurrence interval; R, streamflow recession index in days per log cycle; V, streamflow variability index; P, average annual precipitation; Rgn, hydrologic region from Figure 2]

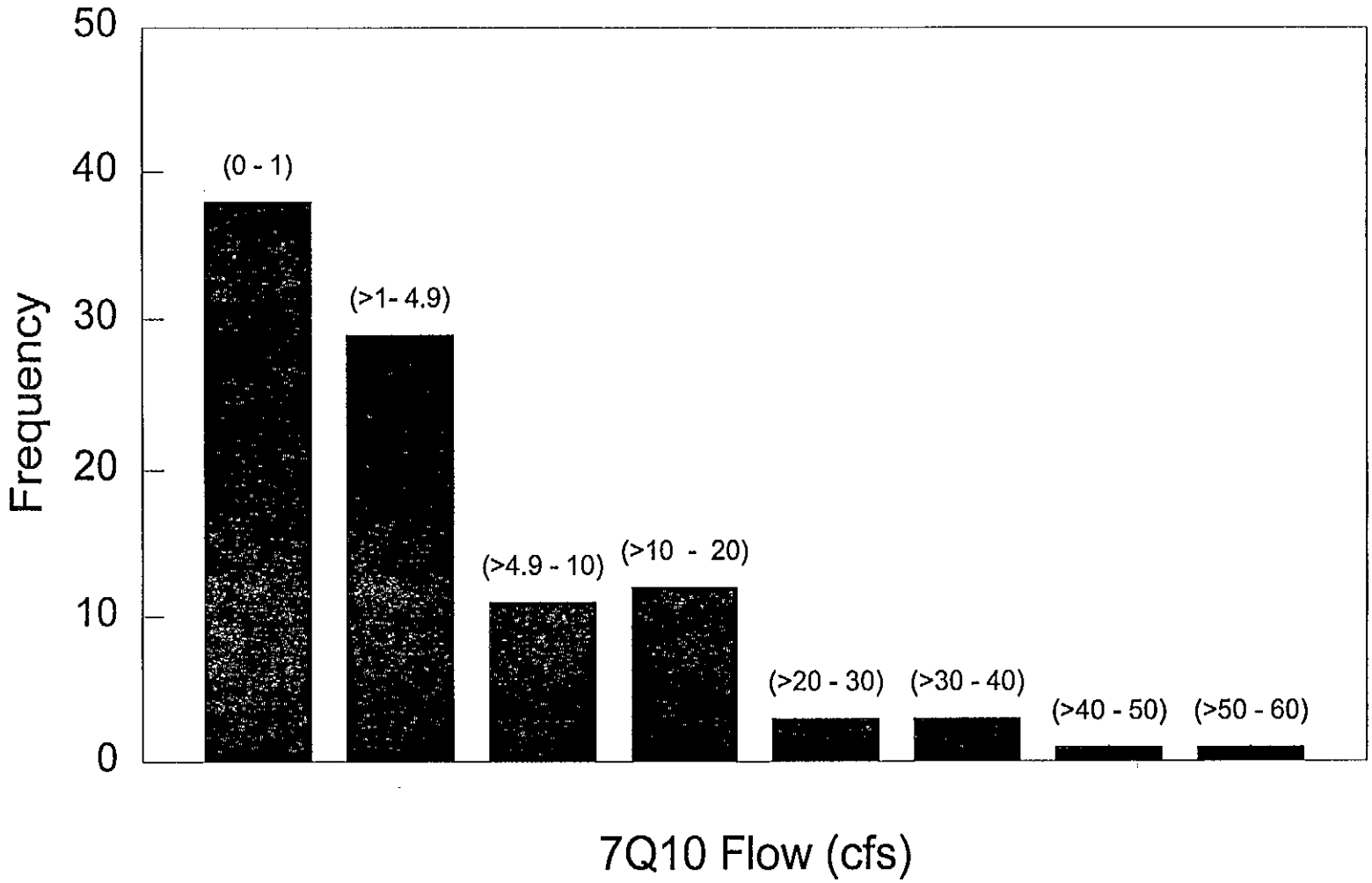
Map No.	Station number	Station name	Period of record	Hydrologic unit	Drainage area (mi2)	Average discharge (ft3/s)	M7,2 (ft3/s)	M7,10 (ft3/s)	Elev (feet)	R	V	P (inches)	Rgn
075	03189500	Gauley River near Summersville	1909-16, 1929-65	do	680	1546	48.5	7.20	2960	18	0.557	57	2
076	03189650	Collison Creek near Nallen	1967-77	do	2.78	4.71	.053	0	2080	14	0.707	54	2
077	03190000	Meadow River at Nallen	1909-16, 1929-71	do	287	525	12.8	3.06	2880	19	0.629	49	2
078a	03190400	Meadow River near Mt. Lookout	1967-83	do	365	774	26.6	16.9	2700	25	0.513	50	2
079a	03191500	Peters Creek near Lockwood	1946-71, 1980-82	do	40.9	63.1	1.54	.107	1700	18	0.607	52	2
080	03193830	Gilmer Run near Marlinton	1969-77	05050007	1.80	3.96	.024	0	3690	8	0.740	46	2
081	03194000	Elk River at Webster Springs	1909-16	do	168	408	16.6	7.60	3100	18	0.530	57	2
082a	03194700	Elk River below Webster Springs	1960-83	do	266	702	34.5	13.7	3000	21	0.476	57	2
083	03195000	Elk River at Centralia	1935-63	do	281	665	20.4	4.50	2900	21	0.540	57	2
084	03195500	Elk River at Sutton	1938-60b	do	542	1098	29.9	3.80	2430	24	0.571	55	2
085	03195600	Granny Creek at Sutton	1968-77	do	6.98	9.62	.2	.073	1180	12	0.629	47	1
086a	03198500	Big Coal River at Ashford	1909-16, 1931-83	05050009	391	520	16.2	4.73	1750	19	0.600	51	2
087a	03199000	Little Coal River at Danville	1931-83	do	269	357	11.1	2.22	1630	17	0.609	48	2
088	03200500	Coal River at Tornado	1909-11, 1928-31, 1981-83	do	862	1250	98.7	13.3	1450	20	0.493	49	2
089	03201000	Pocatalico River at Sissonville	1909-16, 1937-80	05050008	238	296	1.00	.100	940	16	0.875	47	1
090	03201410	Poplar Fork at Teays	1968-78	do	8.71	13.1	.194	.066	820	12	0.602	40	1
091	03202400	Guyandotte River near Baileysville	1969-83	05070101	306	465	59.2	33.3	2080	15	0.398	45	2
092a	03202750	Clear Fork at Clear Fork	1975-83	do	126	204	11.9	7.10	1150	30	0.512	50	2
093	03203000	Guyandotte River at Man	1930-62	do	762	984	38.8	14.1	1950	27	0.586	46	2
094	03203600	Guyandotte River at Logan	1950-77b	do	833	1157	87.1	47.6	1900	28	0.480	47	2
095a	03204500	Mud River near Milton	1939-80	05070102	256	288	1.60	.200	950	15	0.819	45	1
096a	03206600	East Fork Twelvepole Creek near Dunlow	1965-83	05090102	38.5	55.3	.655	.026	1080	14	0.694	46	2
097	03207000	Twelvepole Creek at Wayne	1947-54, 1956-66	do	291	320	2.60	.300	1020	16	0.808	45	1
098	03207020	Twelvepole Creek below Wayne	1922-72b	do	300	353	5.90	1.70	1020	19	0.873	45	1
099	03213000	Tug Fork at Litwar	1930-83	05070201	504	557	51.8	28.0	2030	36	0.470	40	2
100a	03213500	Panther Creek near Panther	1947-83	do	31.0	36.6	.787	.165	1830	20	0.652	40	2

FOOTNOTES:

a Index site

b Period prior to regulation

Figure 1. Frequency Distribution of 7Q10 Stream Flows Table 1 Data (n = 98)



Data Taken from Table 1. Low Flow Characteristics of Streams in West Virginia (1989)
Drainage areas < 1000 square miles, and more than 5 continuous years of data.

DIVISION OF ENVIRONMENTAL PROTECTION
1201 Greenbrier Street
Charleston, WV 25311-1088

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JOHN E. CAFFREY
COMMISSIONER

July 21, 1997

Ms. Libby Chatfield
Technical Advisor
Environmental Quality Board
1615 Washington Street, East
Suite #301
Charleston, WV 25311

Re: Site-Specific Revisions to
Water Quality Standards -
Harmon Creek, Weirton Steel

Dear Ms. Chatfield:

The Office of Water Resources has completed the review of the reports related to the referenced matter. These reports were submitted with a letter, dated June 2, 1997, by Mr. Gene P. Current of Weirton Steel. By this letter, Mr. Current has requested site-specific revisions to the water quality standards for Harmon Creek for iron, lead, zinc, phenols, free cyanide, temperature and fluoride. At present, as per 46 CSR1.7.2.d.16.2, there are site-specific water quality standards for temperature, total iron and fluoride. Thus, Mr. Current has included several additional pollutants.

First, the agency provides comments on the request for site-specific water quality standards for additional pollutants. In the agency's opinion, at this time, such a request is not justified because of the following reasons:

1. Weirton Steel does not have to comply with the final permit limits until June 30, 1999. Therefore, there is no urgency.

2. Weirton Steel is in a process of modifications (upgradings) of the wastewater treatment system for Outlet 004. There is no way to predict concentrations of various pollutants in the discharge after all the upgradings are in place. The proposed water quality standards are based upon statistical analysis of effluent data generated by the existing wastewater treatment system having a very short retention time and having C&E lagoons with short-circuiting problems (and hence poor settling of solids). Therefore, the proposed water quality standards do not represent the performance of a properly operated and maintained BAT treatment system.

3. While carrying out statistical analysis of effluent data, outliers (due to spills, upsets etc.) were not discarded.

Therefore, the proposed water quality standards may be too lenient. This concern was expressed to Mark Vignovic by Mr. Naresh Shah of my staff.

4. Weirton Steel did not provide any aquatic toxicity data (acute & chronic) to demonstrate that the effluent containing pollutants/pollutant parameters at the level of corresponding proposed water quality standards is protective of aquatic life in Harmon Creek. Such data is essential considering the very little dilution available downstream of the discharge from Weirton Steel. Obviously, from this viewpoint, most (if not all) of the proposed maximum daily values as site-specific water quality standards may not be acceptable.

From an aquatic toxicity viewpoint, the agency additionally has concerns for the proposed site-specific water quality standard of 100 F for temperature. Such temperature, by itself and/or in combination with other pollutants, can cause adverse impacts on aquatic life in Harmon Creek during prolonged hot and dry weather. This fact is also supported by results of benthic surveys carried out in Harmon Creek by Weirton Steel. If possible, any site-specific water quality standard for temperature should be lowered to 90 F.

If you have any questions regarding this matter or if you want to meet us to discuss this matter, please feel free to call Messrs. Naresh Shah or Randy Sovic of my staff at 304-558-8855 or at our TDD number 304-558-2751.

Sincerely,

OFFICE OF WATER RESOURCES

Barbara S. Taylor, Chief

cc: Mr. Jerry L. Ray
Asst. Chief, Permits

Comments of Weirton Steel Company

Proposed Revisions to 46 CSR 1 - Water Quality Standards

July 21, 1997

Introduction

Weirton Steel Corporation ("WSC") is pleased to submit these comments to the proposed revisions to 46 CSR 1, the West Virginia Water Quality Standards (the "Proposal"). WSC owns and operates an integrated steel mill located on the banks of the Ohio River in Weirton, West Virginia. WSC is the single largest taxpayer in the State of West Virginia and employs approximately 5200 people. WSC withdraws millions of gallons of water per day from the Ohio River for use in the mill. This water is treated and used for a variety purposes, including contact and noncontact cooling water, air pollution control makeup water, and drinking water. Some of this water is recycled and reused in the mill. The remainder is discharged at three process outfalls into the Ohio River ("Outlet 002" and "Outlet 003") and Harmon Creek ("Outlet 004").

WSC offers comments on three specific areas of the proposal:

1. The site-specific water quality standards for Harmon Creek;
2. The criteria for Phenolic Materials; and
3. The applicability of the "One-Half Mile Rule" of Section 7.2.a.2 to a short section of the Ohio River.

Site-Specific Water Quality Standards for Harmon Creek

Harmon Creek in the vicinity of WSC's Outlet 004 is subject to site-specific water quality standards for three parameters: Iron, Temperature, and Fluoride. These site-specific standards were enacted by the Water Resources Board and the Legislature in the mid-1980's. By letter dated January 8, 1997, the Environmental Quality Board (the "Board") requested that WSC provide new information to support these standards. Shortly thereafter, the Board also entered a Consent Order and Agreement which imposed new, more stringent effluent limitations for

several parameters (Lead, Zinc, Phenols, and Free Cyanide) at Outlet 004, effective in June of 1999.

After a series of conference calls between representatives of WSC, the Board, the Office of Water Resources ("OWR"), and the United States Environmental Protection Agency ("EPA"), it was agreed that WSC would submit study reports to support the existing site-specific standards for Iron, Temperature, and Fluoride, and new site-specific standards for Lead, Zinc, Phenols, and Free Cyanide. Workplans for the following studies were presented to the Board, OWR, and EPA on April 11, 1997:

1. Financial and Socioeconomic Effects of Compliance with West Virginia Water Quality Regulations at Harmon Creek (the "Socioeconomic Study");
2. Drinking Water Use Survey of Harmon Creek Between Outfall 004 and the Confluence of the Ohio River (the "Drinking Water Use Study"); and
3. Section 316(a) Study for Harmon Creek in the Vicinity of Weirton Steel Corporation's Outlet 004 (the "316(a) Study").

Final reports for these studies were submitted by letter dated June 2, 1997. These reports are incorporated by reference into these comments as if fully set forth herein. Based on these reports, WSC requested site-specific revisions to the water quality standards for Harmon Creek to allow for the following effluent limitations on the discharge from Outlet 004:

Free Cyanide	70 ug/l, Daily Maximum
Lead	14 ug/l, Daily Maximum
Phenols	10 ug/l, Daily Maximum

Zinc	200 ug/l, Daily Maximum
Temperature	100°F (monitored per Footnote 12 of the permit)
Iron	4.0 mg/l, Monthly Average and 8.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit)
Fluoride	2.0 mg/l, Monthly Average and 4.0 mg/l, Daily Maximum (monitored per Footnote 12 of the permit)

WSC believes that the reports amply demonstrate the basis for this request. The Drinking Water Use Study demonstrates that the Category A Use is not appropriate for this segment of Harmon Creek, and this conclusion supports the Fluoride revision. The 316(a) Study demonstrates that the thermal discharge from Outlet 004 does not have an adverse impact on the aquatic community in Harmon Creek, and this conclusion supports the Temperature revision. The Socioeconomic Study demonstrates that WSC cannot afford to invest the $30.8 million which would be necessary to ensure consistent compliance with the state-wide water quality standards, and that the attendant loss of jobs from such an investment would create widespread socioeconomic harm in the Steubenville-Weirton metropolitan area. These conclusions further support the Fluoride and Temperature revisions, as well as the Free Cyanide, Lead, Zinc, Phenols, and Iron revisions.

WSC supports enactment of Section 7.2.d.16.2 of the Proposal in that it maintains the existing site-specific standards for Iron, Fluoride, and Temperature. However, for the reasons set forth in the Socioeconomic Study, it should be modified to also provide the requested site-specific standards for Lead, Zinc, Phenols, and Free Cyanide.

The Criteria for Phenolic Materials

As a major discharger on the upper reach of the Ohio River, WSC has long been concerned about the "across the board" criteria of 5 ug/l for Phenolic Materials, particularly when these criteria are compared to the much less stringent criteria of Pennsylvania and Ohio. WSC expressed the basis for these concerns in its written comments dated March 31, 1997 and in its verbal comments during the public meetings of June 3rd and June 13th.

WSC commends the Board for addressing this issue during this review of the water quality standards, and for attempting to conform its standards with EPA's criteria. However, WSC believes that a few additional changes are necessary to achieve the goal expressed by the Board during its meeting of June 13th.

By way of background, there are two "sets" of EPA water quality criteria. One set is published for guidance purposes, only, and is used by many states for the development of state water quality standards. The most recent set of these guidances is commonly known as the "Gold Book," and is updated periodically. The other set is codified at 40 C.F.R. § 131.36 and is used by EPA to impose mandatory water quality standards in states which do not comply with the requirements of Section 303(c)(2)(B) of the federal Clean Water Act (the "Mandatory Criteria"). Interestingly enough, the two sets of criteria provide different values for the parameter "Phenol," which is one of several "Phenolic Materials,"[1] and neither provides a value for "Phenolic Materials."

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[1]The EPA-approved test method for "Phenols" is Manual Distillation (Method 420.1) followed by either manual or automated Colorimetric (4AAP) analysis (Methods 420.1 and 420.2). 40 C.F.R. § 136.3, Table IB. The EPA-approved test methods for "Phenol" are either GC (Method 604) or GC/MS (Methods 625 and 1625). Id. at Table IC.

The Gold Book provides an Acute Aquatic criterion of 10,200 ug/l and a Chronic Aquatic criterion of 2560 ug/l, both for Phenol. These values are included in Section 8.24 of the Proposal as aquatic criteria for Phenolic Materials. The Gold Book also provides a Human Health, Fish Consumption criterion of 3500 ug/l.

The Mandatory Criteria provide a Human Health, Water and Organism Consumption criterion of 21,000 ug/l, and a Human Health, Organism Only Consumption criterion of 4,600,000 ug/l.[2] The Mandatory Criteria do not include any values for aquatic criteria.

Although there are no clear reasons for the apparent discrepancies between the two sets of EPA criteria, they do reveal several very important points:

1. As all of the criteria are for Phenol, which is just one of several Phenolic Materials, and as all of the criteria are orders of magnitude greater than the existing West Virginia water quality standard of 5 ug/l, there is no legitimate scientific or regulatory basis for the 5 ug/l standard.
2. The appropriate parameter for regulation in the water quality standards is Phenol, not Phenolic Materials.

WSC recommends that the Board continue to apply the Gold Book aquatic values of 10,200 ug/l and 2560 ug/l, even though they would not be mandated by EPA, but that the Board change the regulated parameter from Phenolic Materials to Phenol. WSC also recommends that the Board replace the 5 ug/l Phenolic Materials criterion for the Category A Use with the

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[2]Note that although there are EPA Human Health surface water criteria for Phenol, there are no federal Maximum Contaminant Levels for either Phenol or Phenolic Materials. See 40 C.F.R. Parts 141 and 143.

Mandatory Criteria value of 21,000 ug/l for Phenol. These revisions will result in conservative, scientifically-based regulation of Phenol in the waters of West Virginia, while at the same time placing West Virginia industry on a level competitive field with industries in other states.

The "One-Half Mile Rule" and the Ohio River

As noted above, drinking water for the mill is one of the uses for the water withdrawn from the Ohio River by WSC. This water is treated by WSC in an onsite drinking water plant. The drinking water always has met the applicable drinking water standards and it will continue to do so.

The drinking water plant is located less than one-half mile downstream from the Outlet 002 discharge on the Ohio River. The discharge from Outlet 002 is almost entirely "once-through" noncontact cooling water, which is also withdrawn from the Ohio River. As such, Outlet 002 is basically discharging water taken from the Ohio River back into the Ohio River.

As it currently exists, the One-Half Mile Rule would require WSC to relocate either the intake for the drinking water plant or the Outlet 002 discharge, or ensure that the discharge from Outlet 002 meets the water quality criteria "end-of-pipe." Preliminary studies indicate that the most cost-effective engineering solution would be to relocate the drinking water intake at a cost of approximately $1 million. The relocation would have absolutely no beneficial impact on the quality of the water in the Ohio River or the quality of the drinking water from the drinking water plant. Indeed, if anything, the relocation would have an adverse impact on the aquatic community in the Ohio River because of the dredging and piling work which would be necessary for the new intake structure.

This situation is completely different from that which the One-Half Mile Rule is designed to protect against (i.e., a situation where an industrial discharge is unfairly placing an additional burden on another party's drinking water supply). Under these facts, it should be WSC's decision where to treat the water to drinking water standards (i.e., at the discharge from Outlet 002 or at the drinking water plant).

WSC suggests that the most appropriate way to address this issue is to exempt a very short stretch of the Ohio River from the One-Half Mile Rule. Specifically, WSC proposes that Section 7.2.d.15 be amended to provide as follows:

> Except that the provisions of 7.2.a.2 of these regulations shall not apply to the Ohio River main channel (between Brown's Island and the left descending bank) between river mile points 61.0 and 63.5.

WSC believes that this small amendment is appropriate for a number of reasons, including:

- WSC is the only entity impacted by the amendment;
- WSC owns all of the land immediately adjacent to the shoreline along this section of the Ohio River;
- The next closest drinking water intake is several miles downstream at river mile point 65.3, and as such will not be impacted by this amendment; and
- The remaining water quality regulations will ensure that the discharge from Outlet 002 is protective of human health and the environment.

Conclusion

For the reasons set forth above, WSC encourages the Board to:

1. Retain the existing site-specific standards for Harmon Creek for Iron, Temperature, and Fluoride, as set forth in the Proposal;

2. Enact site-specific standards for Harmon Creek for Lead, Zinc, Phenols, and Free Cyanide;

3. Replace the existing state-wide aquatic and human health criteria for Phenolic Materials with the EPA aquatic and human health criteria for Phenol; and

4. Modify Section 7.2.d.15 to provide that the One-Half Mile Rule does not apply to a short section of the Ohio River.

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July 21, 1997

Environmental Quality Board
Charles Jenkins, Chairman
1615 Washington Street, East
Suite 301
Charleston, WV 25311-2126

VIA HAND DELIVERY

Chairman Jenkins and Members of the Board:

I represent the Affiliated Construction Trades Foundation, ("ACT"). Pursuant to WV Code § 29A-3-5, ACT submits the attached comments (original and six copies) regarding the Environmental Quality Board's Proposed Amendments to 46 CSR 1 "Requirements Governing Water Quality Standards."

I am also enclosing an additional copy and hereby request that this copy be stamped "received" and returned to me.

Thank you for your attention to this matter. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Shirley A. Skaggs

/jlk
Enclosure

cc: Steve White, Director, ACT Foundation

Comments on the Environmental Quality Board's Proposed Amendments to 46 CSR 1 "Requirements Governing Water Quality Standards"

Submitted by:

Affiliated Construction Trades Foundation
Charleston, West Virginia

Prepared by:

Carpenter Environmental Associates, Inc.
70 Hilltop Road
Ramsey, New Jersey 07446

CEA No. 97039
July 21, 1997

The Affiliated Construction Trades Foundation (ACT) has reviewed and evaluated the revisions to 46 CSR 1 proposed by the Environmental Quality Board (EQB). Of particular concern are the proposed revisions to the body burden criteria. Comments 1 and 2 deal specifically with the body burden criteria and the dioxin (2,3,7,8-TCDD) standard. Comment 3 provides ACT's recommendations regarding the other proposed revisions to the rule. Comment 4 summarizes additional areas of the rule which should be reviewed and possibly revised as part of the triennial review.

Comment 1. The body burden criteria at Appendix E, section 8.22.2 should not be deleted. Rather, these criteria should be retained and adjusted to reflect "an estimated risk level of one additional cancer case per one million persons" as required in section 8.2.a of the regulations.

In considering the EQB's proposal to delete body burden criteria, ACT believes it is crucially important for the EQB and the legislature to remember why there are fish body burden criteria presently in the regulations. Taking the dioxin criterion as an example (the same arguments apply to the other bioaccumulative compounds of concern listed at 8.22.2), the Water Resources Board (WRB) (now the EQB) recognized in its August 19, 1991 "Rationale Document" that the dioxin body burden criterion was being proposed as "an additional criterion for allowable fish tissue burden" and is "intended for additional safety to fish consumers" (State Water Resources Board of West Virginia, Rationale Document for Revision of Legislative Rules, Title 46, Series 1, Water Quality Standards, August 19, 1991, page 52). The following Spring, the Legislature had the vision to adopt this additional protection into the rules. But now, the EQB, based on the recommendations of the interagency panel wants to delete the body burden criteria that were purposefully voted in by the Legislature. Why? Well, it appears to ACT that there has been much palaver and blather at the interagency committee meetings over unfounded concerns with the complexity of implementing body burden criteria, confusion over lipid content, partition coefficient, and bioaccumulation factors as they relate to body burden criteria, possible inconsistency with fish consumption advisories, and the like. This misinformation, rather than being analyzed and then dispelled by the committee, was embraced as true, resulting in the recommendation to abolish the criteria. We request that the EQB and the Legislature consider the true facts:

a. Fish body burden criteria are the most direct means of protecting fish consumers from unacceptable risk. Water quality criteria are established at a level to protect the aquatic environment, wildlife, human health, etc., depending upon which of these categories is most at risk from exposure to a particular pollutant. For instance, copper, at concentrations that are very harmful to the aquatic environment, has little or no effect on humans. Therefore, the water quality criteria for copper are established at a level that will protect the aquatic environment, not human health. On the other hand, dioxin and the other bioaccumulative contaminants of concern addressed by the rule are very harmful to humans, and so, water quality criteria are established at levels that will protect human health. Both the body burden criteria and

the instream water quality criteria are based on protection of human health. Exposure to dioxin occurs from eating contaminated fish, drinking contaminated water, or both, but, the greatest exposure pathway is by eating contaminated fish. This is demonstrated by comparing the instream criteria for Class A and Class C waters. In Class A waters, where exposure is by eating fish and by drinking water, the criterion is 0.013 pg/l (picograms per liter, or parts per quadrillion). In Class C waters, where exposure is from eating fish but not from drinking water, the standard is 0.014 pg/l, just 8% less stringent than in Class A waters. Thus, eating fish is by far the more significant human exposure pathway. It is clear then that determining how much dioxin (or other substance) in fish tissue presents an unacceptable risk to human consumers is a more direct method of protecting humans than determining the concentration in ambient water that will result in a fish living in that water accumulating dioxin to the extent that eating the fish presents an unacceptable risk.

It is instructive to realize that one of the starting points used by EPA to derive in stream water quality criteria is the acceptable body burden in fish tissue. That value is calculated from the risk specific dose (RSD), (which is the risk level (1 in 10^6 in West Virginia) divided by the cancer potency factor), body weight of the fish consumer (70 kilograms), and the fish consumption rate (about six pounds per year, or, just under one-half pound per month). The calculation does not require information about bioaccumulation factors, lipid content of the fish, or dissolved and particulate organic carbon content of the water in which the fish lived. All of this information is necessary to go the next step and develop an instream criterion based upon a body burden in fish that presents an acceptable risk to humans or, once the criterion is established, follow the proposed protocol for back calculation.

Establishing a body burden criteria for edible fish tissue that reflects a 1 in 10^6 risk of cancer is the most direct means of protecting fish consumers. In other words, if we know what fish body burden presents a 1 in 10^6 risk to human consumers, and we can sample and analyze fish tissue from West Virginia waters to determine if that body burden is being exceeded, why would we also want to rely upon organic carbon, partition coefficient and bioaccumulation data (all of which introduce additional variability and uncertainty) to estimate whether the instream water quality standard is violated? The answer clearly is we shouldn't. Rather, we should realize that if a body burden criterion is exceeded, that constitutes a violation of the water quality standard: the fish tissue presents a cancer risk of greater than 1 in 10^6 and, the contamination in the fish results directly from the fish having lived in unacceptably polluted water.

There was some discussion by the panel that because different fish species are likely to have different lipid percentages in their tissue, body burden criteria would have to be species specific or would have to be expressed on a lipid normalized basis. This is simply not true. The edible fish tissue criteria are established to limit human cancers

to a 1 in 10^6 risk from consuming the edible tissue. The lipid content of that tissue has no bearing on the risk to the human consumer of the fish. For example, considering dioxin contaminated fish, consuming a panfish fillet with tissue dioxin concentration of 0.08 pg/g (picogram per gram or, parts per trillion) and a typically low lipid content or a salmonid fillet with a tissue dioxin concentration of 0.08 pg/g but a typically high lipid content poses the same unacceptable cancer risk to the human consumer (and, because the criteria is exceeded (see below), identifies the water body from which the fish came as impaired). For this reason, numeric body burden criteria should not be tied to the lipid content of the fish or the species of fish. The lipid content of the fish is only important if water column concentration is to be estimated by back calculation from fish tissue concentration.

The present dioxin body burden criterion for edible fish fillets is 6.4 pg/g. EPA Region 3 objected to this criterion because it did not reflect a risk of 1 in 10^6 as is required by West Virginia regulations (Section 8.2.a). EPA also provided a risk specific dose for dioxin and the other bioaccumulative contaminants of concern. Using EPA's RSD adjusted to a risk of 1 in 10^6, the human body weight of 70 kilograms, and a fish consumption rate of on-half pound per month (0.0065 kg/day), a dioxin body burden criterion of 0.07 pg/g results (see Attachment I). ACT recommends that the good intentions of the Legislature expressed in 1992 by establishing body burden criteria as an "additional measure of protection" be preserved and that the present dioxin body burden criterion for edible fish fillet be amended to 0.07 pg/g in order to reflect no greater than a 1 in 10^6 risk of cancer as required by West Virginia rules. ACT also recommends that the OWR and EQB, working in concert with EPA Region 3, adjust the fish body burden criteria of the other bioaccumulative compounds of concern to reflect no greater than a 1 in 10^6 risk of cancer.

b. Fish body burden criteria and fish adversaries are compatible. There was discussion at the interagency meetings that continuing to have numerical body burden criteria in the West Virginia water quality regulations would lead to confusion with fish advisories published jointly by West Virginia's DEP, DNR, and BPH. ACT disagrees and presents the following scenario in demonstration. Let's assume that the dioxin body burden criteria has been amended to 0.07 pg/g for edible fillets and that catfish fillets collected from the Ohio River in the Greenup Pool have a dioxin level of 0.08 pg/g, or, just above the body burden criteria. What does this information tell us? It informs the OWR that, 1) the fish body burden is exceeded and that the fish thus presents a cancer risk of greater than 1 in 10^6, and 2) that the water quality of the river in which the fish lived is impaired and should thus be identified as such on the State's 303(d) list in order that investigation and cleanup plans can be initiated. It informs the health agency that it is appropriate to advise the citizens that for the average person, eating more than one-half pound serving per month of catfish from the Greenup Pool presents an additional cancer risk of greater than 1 in 10^6. Also,

recognizing that children, women of childbearing age, and nursing mothers may be at greater risk, the agency could advise that they consume even less catfish than the average person, or better yet, none at all. Similarly, if fish analyses determine that the fish body burden criteria are not violated, but some contamination does exist, the agency can advise those at higher risk than the average individual of the potential dangers of consumption. So, retaining amended body burden criteria that would reflect a 1 in 10^6 additional risk is not inconsistent with issuing health advisories to protect the public health.

c. EPA Region 3's concerns with Section 8.22.1 of the present regulations can be allayed in a much more straightforward manner than the extensive rewrite of the regulations proposed by the EQB. It is useful to recall EPA's August 6, 1996 letter, which provided the impetus for establishing the interagency committee, in order to outline EPA's concerns with Section 8.22.1 and possible remedies which should be acceptable to EPA. That letter establishes that EPA earlier disapproved and recommended deletion of Section 8.22.1 of West Virginia's Water Quality Standards Rule, but that, upon reconsideration, decided that this section (or the intent of this section) could be retained if EPA's concerns regarding it were allayed. Section 8.22.1 describes how instream values can be determined if the specified criteria (the instream water column criteria) are less than the practical quantification level (PQL).

With respect to Section 8.22.1, EPA was concerned that one interpretation of the regulation could lead to "alternative" criteria being developed. As EPA reported, "Section 8.22.1 states that when specified criteria are less than the PQL, instream values shall be calculated from discharge concentrations, flow rates, and fish body burdens." Apparently, it was EPA's concern that these calculated instream values would be considered criteria and substituted for the numeric instream water quality criteria listed at Appendix E. Thus, for instance, the dioxin water quality criterion of 0.013 pg/l, which is below the PQL, might be replaced by some value other than 0.013 pg/l calculated from discharge concentrations, flow rates, and fish body burdens. While we believe EPA's fear that "instream values" would be confused with the listed criteria in Appendix E may be unwarranted, their concern can be addressed in a straightforward manner by adding explanatory language to the existing Section 8.22.1. The revised Section 8.22.1 should read:

> "The organic compounds listed in §8.22 shall not exceed the specified water quality criteria. When specified criteria are less than the practical laboratory quantification level, instream values will be calculated from discharge concentrations and flow rates and from fish body burden, where applicable. The methods to derive such instream values shall be approved by the Chief. These instream values will be compared to the specified water quality criteria to determine compliance with the criteria and to estimate background concentrations of the parameter in the receiving water."

It is our belief that this language clarifies West Virginia's intention in §8.22.1, as recognized by EPA in their letter, "to determine the ambient concentrations for compliance with water quality standards when the levels in the stream are below detection..." EPA further recognized that fish tissue concentrations can be "an important tool" to determine compliance with water quality standards and enclosed an example procedure for calculating instream dioxin concentration from lipid normalized fish tissue concentrations. This procedure was developed by EPA from research conducted as part of the Great Lakes Water Quality Initiative and was chosen by EPA Region 3 as being appropriate for use in West Virginia by appending it to its "A Study of Background Dioxin Concentrations in the Ohio River at Apple Grove, West Virginia" and its most recent letter. It is also one of the "protocols" recommended by the interagency committee and included in the proposed regulation. This is a scientifically valid procedure for calculating instream dioxin concentrations from fish tissue concentrations. The revised language of Section 8.22.1 recommended by ACT would allow the Chief to approve the use of this procedure. Additionally, other similarly scientifically valid procedures may be appropriate to calculate instream values from fish tissue concentrations for dioxin and other parameters listed in Section 8.22, whose PQL is greater than the specific criterion. The language recommended by ACT would allow the Chief to evaluate these other procedures and approve them if appropriate.

In contrast, the language proposed by the EQB limits the choice of procedures to the high volume sampling method, the semi-permeable membrane method, and the back calculation method described above. The proposed regulations do not allow the Chief any latitude to consider other procedures to calculate instream concentrations; procedures that could be just as valid as those proposed by the EQB. In particular, by deleting the present language from Section 8.22.1, the valuable tool of calculating instream values from discharge concentrations and flow rates[1] is removed from the hands of the agency and the regulated community, and the proposed alternate language would not allow the Chief to approve its use. ACT agrees that the three procedures set forth in the proposed regulations are, when properly implemented, appropriate for use in determining instream concentrations of the bioaccumulative chemicals of concern. However, we stress that the Chief should have the opportunity to evaluate and approve other procedures that are demonstrated to be valid.

Finally, with respect to the EQB's proposed Section 8.5, ACT points out that including the high volume sampling method and the semi-permeable membrane method in a section entitled "Implementation procedures for parameters with water quality criteria which are lower than the detection limit" is illogical. These methods

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[1] Using this method entails calculating instream concentrations (which are not directly measurable because they are lower than the detection limit) from concentrations in an effluent discharge (which are measurable) and the dilution provided by the receiving stream flow.

are direct methods. The are recognized as such in the proposed regulation as means of "direct measurement of water concentrations" which logically implies that they can be employed to directly measure whether the instream concentrations meet or exceed the water quality criteria. Therefore, the detection limits of these methods must necessarily be lower than the water quality criteria, a condition which is the direct opposite of that which Section 8.5 is intended to address. Logically, reliable and reasonably available techniques to measure water quality directly should be employed preferentially over indirect methods such as back calculation of water column concentrations from fish tissue values.

Comment 2. The instream water quality criteria for dioxin (2,3,7,8 - TCDD) and other BCCs must be adjusted to reflect a risk level of one additional cancer case per one million persons (1 in 10^6).

West Virginia water quality regulations at 46 CSR-1-8.2.a require that "toxicants which are carcinogenic have human health criteria (Water Use Categories A and C) based upon an estimated risk level of one additional cancer case per one million persons..." The present dioxin water quality criteria of 0.013 pg/l for Class A waters and 0.014 for Class C waters were intended, when developed by EPA and adopted by West Virginia, to result in a 1 in 10^6 risk as required by regulation. However, as shown by Attachment II, EPA used a bioconcentration factor (BCF) of 5,000, rather than a bioaccumulation factor to derive the criteria. In the years that have passed since EPA developed the criteria there has been wide realization and acceptance of the fact that bioaccumulation rather than bioconcentration more accurately reflects the relationship between instream dioxin concentrations and fish tissue levels. In the present case, this is best demonstrated by the EQB's proposal to adopt the procedure to calculate instream concentrations of dioxins and the other BCCs from fish tissue concentrations by using appropriate bioaccumulation factors (BAFs) (see Appendix F and Table F-1 of the proposed rules). Therefore, more scientifically valid instream criteria can be derived using the recommended protocol instead of the now obsolete method originally used by EPA. In this way, starting with the fish tissue level that presents a 1 in 10^6 risk, and the protocol and supporting information provided by the EQB in the proposed rule, amended, more accurate water quality criteria can be derived.

The edible fish tissue level that presents a 1 in 10^6 human cancer risk is 0.07pg/g, based on a 70 kg body weight and EPA's cancer potency factor (CPF) and fish consumption rate (FCR) (see Attachment I for the calculation). ACT back calculated the appropriate Water Quality criterion from the 0.07pg/g fish tissue concentration utilizing the following:

- EQB's proposed protocol
- EQB's recommended dioxin BAFs for trophic levels 3 and 4
- EQB's recommended partition coefficient (log K_{ow}) for dioxin
- EPA's average percent lipid values for edible tissue for trophic levels 3 and 4 from the Great Lakes studies
- average POC and DOC values from all West Virginia STORET stations

The resulting calculated instream value for trophic levels 3 was 0.0062 pg/l and for trophic level 4 was 0.0038 pg/l, both of which are significantly lower than the present dioxin standard of 0.013 pg/l (see Attachment III for calculation). Therefore, the current 0.013 pg/l dioxin standard presents a risk greater than the 1 in 10^6 risk required by West Virginia regulations. ACT recommends that the EQB derive and propose amended instream standards for dioxin and the other bioaccumulative chemicals of concern; standards that comply with the regulations.

Comment 3. Review of Proposed Changes.

a. Section 7.2.d. The EQB proposes deletions of and revisions to variances and site specific criteria in section 7.2.d. The EPA requested that the State establish scientifically defensible bases of the site specific exemptions in this section. EPA disapproved this section pending justification and discussion with the State. While many of the site specific criteria have been revised, the proposed rule does not provide justification for these site specific variances as requested by the EPA. ACT has requested and received from the EQB all background information and supporting documentation regarding the proposed revised regulations. The supporting documentation does not include justification of the site specific variances (excluding the Cheat River discussed below). Therefore, ACT recommends that these site specific variances be deleted from the proposed rules until justification is provided and made available for public comment and review.

b. Section 7.2.d.7.1. Site-specific numeric criteria for aluminum, iron, manganese and selenium in two tributaries of the Cheat River are proposed. It is proposed that site specific criteria for iron and selenium shall apply to an unnamed tributary of Daugherty Run approximately one mile upstream of Daugherty Run's confluence with the Cheat River and that site specific criteria for aluminum and manganese shall apply to Fly Ash Run of Daugherty Run. The Allegheny Power Company proposed these site specific criteria to ensure that the Albright Power Station, located in Albright, West Virginia does not exceed current and expected water quality based effluent limitations for these parameters. As stated above, the EPA has stated that site specific criteria must be scientifically defensible. As explained below, the Allegheny Power has not provided sufficient justification to support the use of these alternate criteria. ACT recommends that these criteria be rejected until such time as sufficient supporting data are available.

   To determine the site-specific criteria for aluminum, the company used a two-tiered approach. They first calculated the water-effect ratio (WER) and then performed a recalculation procedure. The final recommended site specific criterion was calculated by multiplying the recalculated criterion by the WER, resulting in a chronic criterion of 888.5 ug/l. However, Allegheny Power did not correctly follow the EPA guidance regarding the use of the WER or the recalculation procedure and, therefore, the recommended criterion is not valid.

The WER is a measurement of relevant differences between the toxicity of a metal in laboratory dilution water and in site water. After a WER is determined for a site, a site specific criterion can be calculated by multiplying an appropriate national, state or recalculated criterion by the WER. A WER can be calculated for both acute and chronic criteria but the two WERs so calculated cannot be assumed to be equal (EPA, Interim Guidance on Determination and Use of Water Effect Ratios for Metals, 1994). In some cases it may be appropriate to apply the acute WER to the chronic criterion. However, EPA recommends that the chronic WER be determined if permit limits are to be based upon the chronic criterion. The reports and information sheet provided by Allegheny Power indicate that the site specific criterion for aluminum is a chronic criterion. Therefore, the chronic WER should be determined. The WER determined by the company and used in the calculation of the site specific chronic aluminum criterion is an acute WER. The acute WER calculated by the company does not and can not provide an accurate representation of the chronic WER and should not be used in calculating the site specific chronic criterion.

The second step used by the company in determining the site specific criterion for aluminum is EPA's recalculation procedure. The recalculation procedure determines site specific criteria based upon differences in species and toxicology between the national data set and the site. According to the company, the general approach to the recalculation procedure is to generate a list of species that have been found at the site and to use list this in the process of deleting taxa from the national data set. This is an oversimplification of the recalculation procedure. The EPA recalculation procedure requires corrections and additions to the national data set as well as deletions. In fact, according to the EPA guidance, additions and corrections must be made before the deletion process is performed. Additions and corrections entail EPA approved corrections and additions to the national dataset. Selective additions and corrections are not allowed. All additions and corrections on EPA's current list must be made. The company did not perform any additions or corrections, only deletions, thereby rendering their recalculation procedure incomplete. Additional errors were made in the procedure, casting even more doubts as to the validity of the results. For instance, after deleting taxa which did not occur on site from the national data set, the company determined a site specific final acute value (FAV) of 2,533 ug/l. Then they determined that the site specific FAV differed from the national FAV of 1,496 ug/l by a factor of 1.693. They then derived the recalculated chronic criterion by multiplying the chronic criterion of 0.087 mg/l by the factor of 1.693 to obtain 0.1473 mg/l. This is not an appropriate or EPA recommended method of determining a recalculated chronic criterion. According to EPA guidance (EPA, 1994) the site specific final chronic value (FCV) is calculated by dividing the FAV by the national or site specific final acute to chronic ratio (FACR). The acute to chronic ratio is the ratio of the acute toxicity of an effluent or a toxicant to its chronic toxicity and is almost always greater than one. The Allegheny Power Company did not determine the FACR nor

did they consider it in their calculations. Therefore, these calculations do not follow the EPA guidance, are inaccurate, and should not be used to set a site specific criterion for aluminum.

The EPA recommended criterion of 87 ug/l should continue to be the required criterion for aluminum in the unnamed tributary. Allegheny Power did not calculate the WER or the recalculated criterion following EPA protocol nor did they provide sufficient evidence to show that the method used is scientifically valid. In addition, the EPA recommended value of 87 ug/l is based upon the toxicity of aluminum to brook trout and striped bass. EPA data show that a chronic criterion of 87 ug/l is necessary to protect these two important species. According to the list of taxa provided by Allegheny Power, brook trout is one of the species present in Daugherty Run and, in fact, brook trout were collected as part of the company's study. Therefore, the 87 ug/l criterion should remain in effect to protect this sensitive species.

In an attempt to justify the proposed site specific criteria for manganese and iron, site-specific toxicity tests were conducted. However, the tests conducted can in no way provide scientifically defensible justification of the proposed criteria. Only one set of acute tests and only two sets of chronic tests were run. In addition, the results of the acute tests for one of the two species tested were inconclusive and could not be validly interpreted for either iron or manganese. Additional information must be provided to support the use of these alternate criteria before any revisions to the criteria are approved.

With respect to selenium, Allegheny Power collected brook trout samples from one station on Daugherty Run upstream of the confluence of Unnamed Tributary with Daugherty Run (and upstream of the influence of the outfalls) and at one station downstream of the confluence, an area that is influenced by Allegheny Power's wastewater outfalls. Allegheny Power's data show that the mean downstream selenium concentrations in the brook trout were 21.7 percent and 16.7 percent higher than the upstream mean concentrations on a wet weight and dry weight basis, respectively. The company reports that the upstream and downstream mean values are statistically different. That is, the selenium concentrations in the downstream fish are, in fact, greater than the selenium values in the upstream fish. Also, the data show that the downstream wet weight selenium value of 0.882 ug/g is well above the 0.73 ug/g value reported by Allegheny Power as the 85th percentile of selenium concentrations in fish from 117 stations across the United States. Finally, Allegheny Power admits that the mean selenium concentration in the downstream fish is greater than the safe level suggested for the protection of fish and wildlife (see Tables 9 and 10 of Allegheny Power's June 6, 1997 report). Given these facts, Allegheny Power has not accomplished its goal, as stated in the introduction of its report, "to demonstrate that the existing numeric criteria for the chemicals of concern (46 CSR

1, Appendix E) are overprotective of the aquatic life residing in the receiving stream segments, thereby warranting implementation of the proposed site-specific criteria." For selenium, just the opposite was demonstrated: brook trout are being unacceptably impacted rather than protected. ACT recommends the EQB reject the request for a site specific selenium criterion and, rather, require that Allegheny Power comply with the existing criterion.

Combination tests were run to determine the combined effects of the proposed site specific criteria. These tests do not support the use of the site specific criteria for the unnamed tributary. First, the aluminum concentration used by Allegheny Power in the combined tests was 0.47 ug/l. The proposed site specific criterion is 0.88 ug/l, almost double the concentration used in the tests. Second, the tests showed significant reduction in the reproduction of the test organism *Ceriodaphnia dupia*. The company hypothesized that this reduction was the result of iron precipitate and that the test results could not be properly evaluated. ACT points out that because the test results can not be properly evaluated, they certainly can not be used to demonstrate that the proposed site specific criteria are appropriate.

It is apparent that Allegheny Power Company has not sufficiently demonstrated that the proposed limits are protective of the aquatic community. The WER and recalculation procedure used to determine the aluminum criteria were incorrectly applied and therefore suspect. Very limited data are available to support the manganese, iron and selenium criteria. In fact, half of the tests in support of these criteria came back as inconclusive and can not be used in support of the criteria. The selenium data provided shows that downstream brook trout are unacceptably contaminated. The combination test for aluminum, iron and selenium showed reduced reproductive capacity which demonstrates that these criteria may not be "ecologically safe". Until Allegheny Power Company provides additional data in support of these criteria, ACT recommends that these criteria be rejected.

c. Section 7.2.c.d. Section 7.2.c.d allows an exemption for the application of numeric criteria in waters "where lesser quality is due to natural conditions" and provides that "In such cases the naturally occurring values shall be the applicable criteria". The EPA disapproved this section because is appears to provide a site specific exemption from water quality criteria without providing opportunity for public review and comment and without demonstrating that such criteria are protective of human health and aquatic life. The proposed revision provides that natural conditions may be considered the criteria provided that the existing and designated uses of downstream waters are not adversely affected. ACT recommends that the rule should specify how it would be determined that the existing and designated uses downstream would not be adversely affected. This determination must then be subject to public review and comment. Without this determination and public review, this section continues to allow site specific exemptions from water quality criteria without providing an opportunity for public review and comment.

d. Section 6.3. It is proposed that category B3 "small, nonfishable streams" be removed and Category B1 be revised to include all streams with aquatic life (rather than sport fisheries only). ACT agrees with these revisions.

e. Appendix E Section 8.1. The proposed regulations remove the chronic criterion for the protection of aquatic life for aluminum. No basis for the proposal is provided. The removal of the chronic criterion is not protective of the aquatic life of West Virginia. EPA's Ambient Water Quality Criteria for Aluminum 1988 recommends a chronic criterion of 87 ug/l for the protection of freshwater aquatic species. This is the current chronic criterion for aluminum in West Virginia. This criterion must not be deleted.

f. Appendix E Section 8.12. The proposed Section 8.12 provides that the maximum allowable fecal coliform content for primary contact recreation shall not exceed 400/100 ml at any time. ACT agrees with this proposal.

g. Appendix E Sections 8.15 and 8.15.1. The proposed removal of section 8.15.1 complies with EPA's recommendation. However, the EPA also commented that the current chronic criterion for iron of 1.5 mg/l is less stringent than EPA's recommended aquatic life chronic criterion for iron of 1.0 mg/l. The regulations must either be changed to reflect EPA's number or the State must provide a rationale for the less stringent number.

h. Appendix E Section 8.17 and 8.17.1. The proposed regulations delete the aquatic life criteria for manganese. ACT has no objections to this deletion because the EPA does not currently have recommended manganese criteria for the protection of aquatic life and states that manganese is not considered to be a concern in fresh waters (EPA, Quality Criteria for Water 1986). However, Section 8.17 contains a criterion for manganese in primary drinking source waters that is much less stringent than the EPA recommended criterion. According to EPA's Quality Criteria for Water 1986, the appropriate water quality criterion for manganese for drinking water is 50 ug/l (0.05 mg/l). The current water quality criterion of 1.0 mg/l is much less stringent than the EPA recommended criterion. West Virginia must either adopt the EPA recommended criterion or provide a scientifically valid rationale for the less stringent criterion. The deletion of section 8.17.1 complies with EPA's recommendation.

i. Appendix E Section 8.19. EPA commented that the State should provide a rationale for the use of a chronic criterion for nickel of 50 ug/l in trout waters. Rather than providing a rationale, the proposed revised regulations simply delete this criterion. The EQB should determine the original rationale for establishing a more stringent criterion for trout waters and then determine whether it is appropriate. The EPA did not ask that the criterion be deleted out of hand, simply that a rationale be provided for its use.

j. Appendix E Section 8.22. EPA requested that the state provide the scientific basis for the chronic criteria for aldrin, chloroform, and tetrachloroethane. Instead, the proposed regulations have been revised to reflect the EPA recommended criteria (Quality Criteria for Water 1986). However, the EPA criteria are much less stringent than the current West Virginia criteria. For example, the current West Virginia criterion for chronic exposures to chloroform is 15.7 ug/l. The recommended EPA criterion (and the proposed revised criterion) for chronic exposures to chloroform is 1,240 ug/l. Instead of simply revising the current regulations to meet the less stringent EPA recommended criteria, the EQB should determine the original bases of the current criteria, determine if the criteria are still appropriate, and if the criteria are still appropriate, provide the scientific rationale requested by EPA.

h. Appendix E Section 8.24. The chronic and acute criteria for phenols have been revised to reflect the EPA recommended criteria for the protection of freshwater aquatic organisms. ACT has no objections to this revision.

l. Exemption from Section 7.2.a.B (now 7.2.a.2). Weirton Steel has requested that they be exempted from Section 7.2.a.B (the ½ mile rule) which requires that "each segment extending upstream from the intake of a water supply public (Water Use Category A), for a distance of one half (½) mile or to the headwater must be protected by prohibiting the discharge of any pollutants in excess of the concentrations of the concentration designated for this Water Use Category". This regulations therefore requires that water quality standards for Water Use Category A be met end-of-pipe within ½ mile of a drinking water intake. The Weirton Steel Outlet 002 is within ½ mile of the intake for their drinking water plant. Therefore, the permit for Outlet 002 contains permit limits which are equivalent to the water quality standards. Weirton Steel is requesting that they be exempted from the ½ mile rule because "the discharge from the company's Outlet 002 is almost entirely "once through" noncontact cooling water which is withdrawn from the Ohio River. As such, Outlet 002 is basically discharging water taken from the Ohio River back into the Ohio River." This statement is untrue. According to the permit, Outlet 002 contains treated wastewater from scrubbers, untreated contact and non-contact cooling water and storm water. If Weirton Steel is indeed merely discharging Ohio River water to which no pollutants had been added, they should have no difficulty meeting water quality standards at the end-of-pipe. However, this is obviously not the case. Weirton Steel apparently is unable to meet the requirements of the ½ mile rule and thus they are attempting to change the regulations. The State should not allow this amendment. The ½ mile rule is intended to protect drinking water supplies. By allowing Weirton Steel this amendment the State would be setting a precedent which may endanger water supplies throughout the state.

Comment 4. In their November 6, 1995 letter, the EPA raised numerous concerns with the water quality standards which have not been included in the proposed revised regulations. These sections, listed below, should also be reviewed as part of the triennial review.

a. Section 46-1-2 Definitions. The EPA requested that the definitions of the following terms be clarified: conventional treatment, intermittent streams, natural/naturally occurring, non-point source, and wet weather stream. The revised regulations do not contain clarifications of these terms.

The EPA also requested that definitions for the following terms be added: lethality, mixing zone, surface impoundment, and toxic. The proposed revised regulations do not contain definitions of these terms as requested by the EPA.

b. Section 46-1-4 Anti-degradation Policy. West Virginia should develop anti-degradation implementation procedures which adequately support their policy. Based upon our review of the regulations, it appears that implementation procedures have not yet been developed.

c. Section 46-1-6 Water Use Categories. The EPA recommended that section 6 be revised to include the goal established in section 101(a)(2) of the Clean Water Act which states that "water quality standards should provide for the protection of fish, shellfish and wildlife." As written, the rule states that "at a minimum all waters of the State are designated for the propagation and maintenance of fish and other aquatic life". This goal does not include protection of wildlife such as birds and terrestrial animals that are not considered aquatic life but which may drink or feed in the waters of West Virginia. The water quality standards should be protective of all wildlife as required by the Clean Water Act.

The regulations must ensure that category B criteria fully protect the biological integrity of the water body, including flora and fauna. The EPA commented that it should be made clear that the term "Other aquatic life" includes flora and fauna and all other factors important to the biological integrity of the water body. Section 6 has not been revised to include a clarification of other aquatic life. Neither has a definition of "other aquatic life" been included in Section 2- Definitions.

West Virginia must ensure that its water quality standards provide adequate protection of wildlife in accordance with Section 101(a)(2). The State should identify the instream criteria associated with the protection afforded for wildlife in Category D3 "Wildlife", which includes all stream segments and wetlands used by wildlife.

The application of the last sentence in section 6.1 "Incidental utilization for whatever purpose may or may not constitute justification for assignment of a water use category to a particular stream segment" should be clarified. In addition, the state

should include the rationale for distinguishing between existing uses and incidental uses.

West Virginia needs to specify which waters fall into subcategories B1 and B4. All water bodies of the state should be listed according to the use classification that applies to each or West Virginia should provide some other mechanism that insures that the highest and best use achieved by each water body is protected.

d. Section 46-1-7 West Virginia Waters. The EPA recommended that Section 7.2.c.C be revised to more accurately reflect the application of criteria in mixing zones. Section 7.2.c.C (now 7.2.c.3) has not been revised. This section allows an exemption from water quality standards within a mixing zone or zone of initial dilution. EPA objected to this section on the basis that criteria should still apply within the mixing zone such that a drifting organism passing through the zone would not be exposed to concentrations exceeding the acute criteria when averaged over the 1-hour averaging period for acute criteria. Thus, numeric criteria apply within the mixing zone. Section 7.2.c.3 must be revised to ensure that lethality does not occur to passing and drifting organisms in any portion of the mixing zone.

The EPA requested that section 7.2.c be clarified. This section specifies exceptions to the numeric water quality standards. Exemption A allows that numeric water quality standards need not apply when the flow is less than 7Q10. The EPA believes that Exemption A should specify "criteria" rather than "standards". Exemption B allows that numeric water quality standards need not apply in wet weather streams (or intermittent streams, when they are dry or have no measurable flow). Exemption B must clarify the designated use that would be applied to wet weather or intermittent streams. Existing uses in wet weather streams must be protected. Although there may not be measurable flow in wet weather streams, aquatic life that may exist in pools still must be supported. Exemption C provides that numeric water quality standards need not apply in the mixing zone. This exemption must be clarified to include that lethality can not occur to passing and drifting organisms in any portion of the mixing zone.

e. Section 46-1-8 Specific Water Quality Criteria. According to EPA's comments, the State indicated that section 8.2.b was modified to address the application of numeric criteria for carcinogens. However, EPA was unable to review this change since section 8.2.b was missing from their copy of the rule. Section 8.2.b is also missing from all copies of the regulations which we have received. If the State inadvertently omitted this section from the regulations, this error should be rectified.

f. Appendix E Quality Criteria.

8.6 Beryllium: The current chronic criterion of 130 ug/l is EPA's lowest observable effect level for acute exposure to beryllium. Therefore, the use of 130 ug/l for chronic exposures is not appropriate. This number should be moved to the acute column and 5.3 ug/l should be added to the chronic column.

8.10 Cyanide: The correct number for chronic exposures to cyanide is 5.2 ug/l, not 5.0.

8.11.1 Dissolved Oxygen, Kanawha River: The EPA does not believe that the dissolved oxygen concentration of 4.0 mg/l supports the minimum fishable designation. The EPA requested a use attainability analysis which supports this criterion for the Kanawha River. If the State has not yet provided this analysis, they should do so now as part of the triennial review. If the analysis has not been performed, the criteria should be revised to 5.0 mg/l.

8.14 Chromium: EPA has stated that West Virginia should either include criteria for trivalent chromium or provide a rationale for why the State believes that trivalent chromium criteria are not necessary in West Virginia. If the state has not provided the requested rationale, they must review the need for trivalent chromium criteria as part of the triennial review.

8.26 Selenium: EPA's acute criterion value for selenium is 5 ug/l. The State should either modify the criteria to conform with EPA's or provide a scientifically defensible rationale for the less stringent number.

ATTACHMENT I

Derivation of Edible Fish Tissue Body Burden Standard

1. Calculate the Risk Specific Dose (RSD):

$$RSD = \frac{\text{Cancer Risk Level}}{\text{Cancer Potency Factor}}$$

$$= \frac{1\times10^{-6}}{1.56\times10^{5}\ \text{(kg-day/mg)}} \quad \text{(46 CSR-1-8.2.a)} \quad \text{(EPA Region 3 Risk-based Concentration Table)}$$

$$= 6.4\times10^{-12}\ \text{(mg/kg-day)}$$

$$RSD = 0.0064\ \text{(pg/kg-day)}$$

2. Calculate the Body Burden Standard:

$$\textit{Body Burden Standard} = \frac{\text{Risk Specific Dose x Body Weight}}{\text{Fish Consumption Rate}}$$

$$= \frac{\text{RSD x BW}}{\text{FCR}}$$

$$= \frac{(0.0064\text{pg/kg-day})\ (70\text{kg})}{0.0065\ \text{kg/day}}$$

$$= 68.9\ \text{pg/kg}$$

$$\textit{Body Burden Standard} = 0.07\ \text{pg/g}$$

Attachment II

ORIGIN OF HUMAN HEALTH CRITERIA *

(#)	COMPOUND	CAS Number	CRITERIA * (10^{-6} risk for carcinogens) For Consumption of: Water & Organisms (ug/L)	Organisms Only (ug/L)	LISTED IX IRIS * (Y/N)	IRIS VALUES q1 (kg-d/mg)	RfD (mg/kg-d)	BCF * (L/kg)
1	Antimony	7440360	14 a	4300 a	Y		0.0004	1
2	Arsenic	7440382	0.018 bc	0.14 bc	Y	1.75 d	0.0003	44
3	Beryllium	7440417	0.0077 ac	0.13 ac	Y	4.3		19
4	Cadmium	7440439	16 ap	170 ap	Y		p	64
5a	Chromium (III)	16065831	33000 a	670000 a	Y		1	16
b	Chromium (VI)	18540299	170 a	3400 a	Y	q	0.005	16
6	Copper	7440508	(1300)b		Y			36
7	Lead	7439921	50		Y			
8	Mercury	7439976	0.14	0.15	Y			
9	Nickel	7440020	610 a	4600 a	Y		0.02	47
10	Selenium	7782492	100 b	6800 b	Y			4.8 b
11	Silver	7440224	185 a	65000 a	Y		0.003	0.5
12	Thallium	7440280	1.7 a	6.3 a	Y m		0.000068 m	116
13	Zinc	7440666			Y			47
14	Cyanide	57125	700 a	215000 a	Y		0.02	1
15	Asbestos	1332214	7 E+6 fibers/L r		Y			
16	2,3,7,8-TCDD (Dioxin)	1746016	1.3 E-8 c	1.4 E-8 c	N	1.56×10^{5}		5000
17	Acrolein	107028	320	780	Y			
18	Acrylonitrile	107131	0.059 ac	0.66 ac	Y	0.54		30
19	Benzene	71432	1.2 ac	71 ac	Y	0.029		5.2
20	Bromoform	75252	4.3 ac	360 ac	Y	0.0079		3.75 h
21	Carbon Tetrachloride	56235	0.25 ac	4.4 ac	Y	0.13		18.75
22	Chlorobenzene	108907	680 a	21000 a	Y		0.02	10.3
23	Chlorodibromomethane	124481	0.41 ac	34 ac	Y	0.084 o		3.75 h
24	Chloroethane	75003			Y			
25	2-Chloroethylvinyl Ether	110758			N			
26	Chloroform	67663	5.7 ac	470 ac	Y	0.0061 h		3.75 h
27	Dichlorobromomethane	75274	0.27 ac	22 ac	Y	0.13		3.75 h
28	1,1-Dichloroethane	75343			Y			
29	1,2-Dichloroethane	107062	0.38 ac	99 ac	Y	0.091		1.2
30	1,1-Dichloroethylene	75354	0.057 ac	3.2 ac	Y	0.6 o		5.6
31	1,2-Dichloropropane	78875	(0.52)rc	(39)rc	N	0.067 r		4.11
32	1,3-Dichloropropylene	542756	10 a	1700 a	Y		0.0003	1.91
33	Ethylbenzene	100414	3100 a	29000 a	Y		0.1	37.5
34	Methyl Bromide	74839	48 a	4000 a	Y		0.0014	3.75 h
35	Methyl Chloride	74873	5.7 ac	470 ac	N	0.0061 h		3.75 h
36	Methylene Chloride	75092	4.7 ac	1600 ac	Y	0.0075		0.9
37	1,1,2,2-Tetrachloroethane	79345	0.17 ac	11 ac	Y	0.2		5
38	Tetrachloroethylene	127184	0.8 c	8.85 c	Y			30.6
39	Toluene	108883	6800 a	200000 a	Y		0.2	10.7
40	1,2-Trans-Dichloroethylene	156605	(700)a	(140000)a	Y		0.02	1.58
41	1,1,1-Trichloroethane	71556	3100 a	170000 a	Y		0.09	5.6
42	1,1,2-Trichloroethane	79005	0.60 ac	42 ac	Y	0.057		4.5
43	Trichloroethylene	79016	2.7 c	81 c	Y			10.6
44	Vinyl Chloride	75014	2 c	525 c	N			1.17
45	2-Chlorophenol	95578	(120)a	(400)a	Y		0.005	134
46	2,4-Dichlorophenol	120832	93 a	790 a	Y		0.003	40.7
47	2,4-Dimethylphenol	105679	540 a	2300 a	Y		0.02	93.8

FOOTNOTES:

- Unless footnotes indicate otherwise all values are from 1980 criteria documents. A listing in the Integrated Risk Information System (IRIS) does not mean that a q1 (cancer potency factor) or RfD (Reference Dose) is necessarily available for that substance. Values for q1 or RfD (ADI) from the 1980 documents are not shown in the table.

a. Criteria for these footnoted pollutants have been revised to reflect the current Agency q1 or RfD, as contained in IRIS. The fish tissue bioconcentration factor (BCF) from the 1980 criteria documents was retained unless otherwise noted. Criteria in parentheses are new criteria for pollutants that previously had no health-based criteria.

All criteria revised with IRIS values for cancer potencies and Reference Doses are calculated using the following formulas, which involve a 10^{-6} target risk for carcinogens, a 70 kg person, 0.0065 kg/day fish consumption, and for water and organisms consumption criteria, 2 L/day water consumption:

Using cancer potency, q1:	Using Reference Dose:
For consumption of water and organisms: $WQC\ [\mu g/L] = \frac{10^{-6} \cdot 70\ kg \cdot 1000\ \mu g/mg}{q1\ [kg\text{-}d/mg]\ (2\ L/d + (0.0065\ kg/d \cdot BCF\ [L/kg]))}$	For consumption of water and organisms: $WQC\ [\mu g/L] = \frac{RfD\ [mg/kg\text{-}d] \cdot 70\ kg \cdot 1000\ \mu g/mg}{2\ L/d + (0.0065\ kg/d \cdot BCF\ [L/kg])}$
For consumption of organisms only: $WQC\ [\mu g/L] = \frac{10^{-6} \cdot 70\ kg \cdot 1000\ \mu g/mg}{q1\ [kg\text{-}d/mg] \cdot 0.0065\ kg/d \cdot BCF\ [L/kg]}$	For consumption of organisms only: $WQC\ [\mu g/L] = \frac{RfD\ [mg/kg\text{-}d] \cdot 70\ kg \cdot 1000\ \mu g/mg}{0.0065\ kg/d \cdot BCF\ [L/kg]}$

b. Value revised to reflect values in 1989 draft Ambient Water Criteria Document Addenda.

c. Criteria based on carcinogenicity (10^{-6} risk).

d. Arsenic q1=1.75 kg-d/mg is equivalent to the IRIS value 5×10^{-5} risk per µg/L in drinking water.

e. DDT, DDD, DDE: 1980 BCF=53600 taken to apply to all three compounds.

f. These polycyclic aromatic hydrocarbon (PAHs) are classified as B2 (probable human) carcinogens, but q1 values are not available for them. In the absence of values specific to these compounds, the q1 and BCF for benzo(a)pyrene (from the 1980 criteria document) have been used as surrogates.

g. Endosulfan q1 and BCF taken to apply also to endosulfan sulfate. In IRIS, EPA has not distinguished alpha from beta and has used CAS No. 115297 for endosulfan.

h. For these halomethanes, the chloroform q1=0.0061 and/or BCF=3.75 have been taken to apply.

i. Endrin q1 and BCF taken to apply to endrin aldehyde.

j. Heptachlor BCF taken to apply to heptachlor epoxide.

k. The q1 and BCF for PCB-1260 were taken to apply to all PCB formulations, in the absence of values specific to each.

m. In IRIS, EPA has listed thallium sulfate, not thallium alone. The thallium RfD is based on: NOAEL=0.25 mg Tl_2SO_4/kg-d; UF=3000; fraction Tl in Tl_2SO_4 = 0.81.

n. Benzo(a)pyrene BCF assumed to apply to these PAHs.

o. This compound is classified in category C (possible hu
q1 values in IRIS. However, for these footnoted compo

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL

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4

ATTACHMENT III

Calculation of Water Column Concentration from Fish Body Burden Standard

Definition of Terms:

POC = concentration of particulate organic carbon (kg/l)
DOC= concentration of dissolved organic carbon (kg/l)
K_{ow} = n-octanol water partition coefficient for the chemical
C_t = concentration of the chemical in the wet tissue either whole organism or specified tissue (ug/g)
C_l = lipid normalized concentration of the chemical in tissues of the biota (ug/g lipid)
C'_w = total concentration of chemical in the water (kg/l)
f_l = fraction lipid content in the organism
f_{fd} = fraction of the total chemical that is freely dissolved in the water
Baseline BAF = generalized BAF for a specific trophic level, based on total chemical concentration in the water column, and normalized to 100% lipid
BAF^{fd} = BAF (l/kg lipid) reported on the basis of the lipid normalized concentration of chemical in the biota (kg/kg) divided by the freely dissolved concentration of the chemical in the water (kg/l)
BAF'_l = BAF (l/kg lipid) reported on the basis of the lipid normalized concentration of chemical in the biota (kg/kg lipid) divided by the total concentration of the chemical to the water (kg/l)

Data Required:

C_t = average concentration of 2,3,7,8 - TCDD from whole body of skin-on fillet samples
f_l = average percent lipids of whole body or skin-on fillet samples
DOC = average concentration of dissolved organic carbon at fish sampling location
POC = average concentration of particulate organic carbon at fish sampling location

Assume:

DOC = 2.74×10^{-6} kg/l (From STORET - Average of
POC = 1.08×10^{-6} kg/l all stations in West Virginia)
C_t = 0.07 pg/g (fish body burden equivalent to risk of 1×10^{-6})
f_l Trophic level 3 = 1.82% (from GLWQI)
f_l Trophic level 4 = 3.1% (from GLWQI)

Reference data for 2,3,7,8 - TCDD:

Log K_{ow} = 7.02
K_{ow} = 10,471,285.48
Baseline BAF for Trophic Level 3 = 9,360,000
Baseline BAF for Trophic Level 4 = 9,000,000

Calculate freely dissolved fraction of 2,3,7,8 - TCDD in water column:

$$f_{fd} = \frac{1}{1 + POC \times K_{ow} + DOC \times K_{ow}/10}$$

f_{fd} $= 6.58 \times 10^{-2}$ l/kg

Express Baseline BAF on the Basis of total 2,3,7,8 - TCDD:

Trophic Level 3:

$BAF^{t}_{l} = (9{,}360{,}000)\ (f_{fd})$
$= (9{,}360{,}000)\ (6.58 \times 10^{-2})$
$= 615{,}888$ l/kg

Trophic Level 4:

$BAF^{t}_{l} = (9{,}000{,}000)\ (f_{fd})$
$= (9{,}000{,}000)\ (6.58 \times 10^{-2})$
$= 592{,}200$ l/kg

Calculate instream concentration of Total 2,3,7,8 - TCDD:

$$C^{t}_{w} = \frac{C_{l}}{BAF} \qquad C_{l} = \frac{C_{t}}{f_{l}}$$

Trophic Level 3:

$C_{l} = \frac{7 \times 10^{-8}\ ug/g}{0.0182}$

$= 3.85 \times 10^{-12}$ kg/kg

$C^{t}_{w} = \frac{3.85 \times 10^{-12}\ kg/kg}{615{,}888\ l/kg}$

$= 0.0062$ pg/l

Trophic Level 4:

$C_{l} = \frac{7 \times 10^{-8}\ ug/g}{0.031}$

$= 2.26 \times 10^{-12}$ kg/kg

$C^{t}_{w} = \frac{2.26 \times 10^{-12}\ kg/kg}{592{,}200\ l/kg}$

$= 0.0038$ pg/l

west
virginia
highlands
conservancy

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Publishers of The Highlands Voice and the Monongahela National Forest Hiking Guide

July 22, 1997

Environmental Quality Board
1615 Washington Street, East
Charleston, W.V. 25311-2126

RE: 1997 Triennial Review of
WV Water Quality Standards

Chairman Jenkins and Board Members,

The WV Highlands Conservancy (WVHC) would like you to consider the following concerns we have about the proposed WQS.

I. We fully support comments dated March 31, 1997 and submitted to the Board by the following agencies:

a) - the WV Department of Health and Human Services, Bureau for Public Health, especially their recommendations to modify the "1/2 mile rule" to at least "one mile" and to revise the numeric criteria for Mn for Catagory A waters to 0.05 mg/l;

b) - the WV Office of Water Resources, especially 1) their comments on page 3 concerning Section 6.1. and the need to clarify the Board's position that all waters of the state are considered Catagory A (Water Supplies Public) unless proven differently by any discharger, and 2) their comments on page 6 concerning Section 7.2.a.B. concerning the prohibition of overlapping mixing zones in the 1/2 mile segment upstream of a public water supply intake, and

c) - the US Fish and Wildlife Service, especially their comments concerning Aluminum, Selenium and Low Flow and Intermittent Streams.

II. We have not reviewed in detail the request for the exception listed in Section 7.2.d.8 for segments of the Cheat River near the Albright Power Plant, but we urge the Board to carefully consider the request and to deny it if at all possible.

III. Finally, we would like to reiterate some of our concerns about the proposed change to the numeric Manganese Criteria in Appendix E. We refer in particular to the assumptions and questions posed by the EPA Guidance contained in the "Goldbook":

- "[...manganese may be toxic to plants] but, Manganese is RARELY found in surface waters at concentrations greater than 1 mg/l. ... Thus no specific criterion for manganese [in agricultural waters] is proposed."

- "Manganese at concentrations of about 10 to 20 ug/l is acceptable to most consumers. A criterion for domestic water supplies of 50 ug/l should minimize the objectionable qualities."

- "The presence of low concentrations of iron may intensify the adverse effects of manganese."

- "Most industrial users of water can operate successfully where the criterion proposed for public water supplies (50 ug/l) is observed. Examples of industrial tolerance of manganese in water are summarized for industries such as dyeing, milk processing, paper, textiles, photography and plastics (McKee and Wolf, 1963). A MORE RESTRICTIVE CRITERION MAY BE NEEDED TO PROTECT OR ENSURE PRODUCT QUALITY."

- "...manganese is not removed in the conventional treatment of domestic waters."

All of the above statements from the Goldbook indicate that, although there may be little concern about the toxicity of manganese on fish or most other aquatic life, there is certainly ample reason to be concerned about how levels of manganese >1mg/l may impact the quality of life in rural West Virginia as well as the potential to attract diverse industries to some of the more isolated headwater stream areas in the state of WV.

While trying to persuade the federal Office of Surface Mining and the Environmental Protection Agency that technology based effluent limits of 2 - 4 mg/l for manganese from coal mining sites is unreasonable, unsupportable and should be eliminated, the mining industry is also supporting the elimination of the Mn criteria for aquatic life from the state water quality standards so that the imposition of water quality based effluent limits will no longer include a numeric standard for Manganese.

Unless and until industry can prove it impossible (not just inconvenient or relatively uneconomical) for them to treat and remove manganese <u>onsite</u> before the effluent leaves the minesite, WVHC believes that the Board must be sure that state standards do not pass on the burden and cost of treatment to other possible users of the water in question.

A thorough review of alternative treatment methods must be undertaken with the same vigor and intensity that industry has exhibitted in their studies of the toxic effects of manganese on fish.

In light of these concerns, WVHC respectfully recommends retaining the current numeric criterion for Mn of 1 mg/l for aquatic life until WV, EPA or others can guarantee that elevated manganese levels beyond the normally occurring and normally acceptable concentration of 1 mg/l (0.05 mg/l for public water use) will not jeopardize other uses or cause unecessary and undo hardships to other downstream users.

In addition, WVHC also recommends, whether or not the Board decides to eliminate the numeric criteria for Mn for aquatic life, that you:

1) retain and strengthen the criterion for human health (as recommended in the Goldbook and also proposed by the WV Department of Health);

2) be sure to clarify the Board's stated assumption that all waters of the state are to be considered Catagory A (as earlier versions of the water quality standards had stated more explicitly, as the Board has held in its decisions, and as proposed by the Office of Water Resources) unless proven differently by a particular discharger, and

3) ensure that implementation of the anti-degradation policy includes protecting all aspects of high quality waters, including parameters that may not be identified in Appendix E (eg. Mn if removed as a parameter for aquatic life).

As always, WVHC appreciates the opportunity to comment and is grateful to the Board for whatever consideration it can give to the concerns we have listed here.

Please feel free to contact me at the address and/or phone numbers below with any questions you might have about our comments.

Sincerely,

Cindy Rank

Cindy Rank, Chair
Mining Committee
HC 78, Box 227
Rock Cave, WV 26234

phone: (h) 924-5802
(o) 924-6263

cc. John McFerrin, President

Ohio Valley Environmental Coalition Comments
Regarding Proposed Changes to West Virginia's Water Quality Rule
(Body Burden Criteria, etc.)

Ohio Valley Environmental Coalition (OVEC) offers the following comments regarding the proposal to delete the "Body Burden Criteria" in sections 8.22.1 and 8.22.2 of the rule, the substitution of a "back-calculation method" in their place, and the adoption in section 8.3 of the rule of alternate methods of detecting traces of bioaccumulative contaminants for which the water quality criteria are lower than the current detection limit:

(1) It is possible that our state's waters and their inhabitants are reaching the assimilative capacity for some persistent bioaccumulative pollutants. The problem of too much dioxin or PCBs in fish tissue has not been a purely technical one, it is also a measure (or the lack thereof) of the democratic values and environmental ethics held by our "public servants". **Solutions to pollution problems require policy makers to make sound permitting decisions over the loud objections of industry.**

(2) The committee assigned by the Environmental Quality Board and charged with the responsibility of reviewing the state's Body Burden Criteria had only one citizen representative. Obviously, any recommendations put forth by a single citizen, no matter how well reasoned, may easily be over-ruled. More over, this committee did not allow membership by others who expressed a desire to serve, such as the Affiliated Construction Trades Foundation legal council, Ms. Shirley Skaggs. Had there been adequate representation of the citizenry, the committee may have met USEPA's objections without throwing out the state's Body Burden Criteria.

The Body Burden Criteria (or "fish tissue standard") for dioxin, for example, is 6.4 ppt. It should be updated to almost 100 times lower, or 0.07 ppt. (EPA acknowledged this in Body Burden Committee meetings, but was fearful the public would panic if true fish standards were used.) The water quality standard for dioxin, based on an outdated estimate of its bioaccumulation from water into fish (and hence to humans) is 0.014 ppq. This value should be updated, based on more accurate estimates of bioaccumulation, to over 10 times lower, or 0.0013 ppq. (EPA refused to acknowledge the math on this issue.)

Our "fish tissue standards" could have been simply updated to the same risk level set for the state's other Water Quality Standards (those other standards need to be updated just as much). Instead, the "public servants" on the committee sided with industry to weaken the state's regulations, by deleting the body burden criteria instead of fixing them.

OVEC proposes the state of West Virginia retain and update its Body Burden Criteria to agree with the 1/1,000,000 risk level established for the state's water quality standards. To accurately correspond to other water quality standards, these

criteria should also be normalized for the fish tissue's lipid content, as this is where the contaminants are concentrated.

OVEC also proposes the state correct all its other risk-based Water Quality Standards, beginning with bioaccumulative chemicals of concern.

(3) USEPA proposed to the Body Burden Committee that a "back-calculation" method, which would estimate the amount of dioxin, etc. in water from its concentration in fish lipids and a number of fudge factors. EPA did not have ready values for its fudge factors, and was not prepared to lead the committee through a single example problem using its admittedly confusing equation. The equation, if properly used, would yield a water quality concentration that could be compared to an outdated water quality standard which was meant to be protective for humans who consume fish.

Why not just directly compare the fish tissue analysis to an updated fish tissue standard (body burden criteria), rather than an equation the committee did not grasp? USEPA was adamant the equation must be used instead of fish standards, because having more than one standard would be "too confusing".

This is such a bold lie some of the committee probably believed it. A quick look in the rule shows West Virginia has many water quality standards for a given contaminant, but only the body burden criteria were singled out for deletion. USEPA has also praised the state of Oregon for being innovative with its development of risk-based sediment standards to protect human health from bioaccumulative chemicals which migrate from sediment into the food chain.

Why is West Virginia singled out for criticism by EPA for having fish standards? Aren't standards for bioaccumulative chemicals in the fish a more accurate a measure of risk due to eating fish than standards for either water or sediments, which estimate that risk with a series of assumptions and fudge factors?

OVEC's representative on the committee attempted to make these points on numerous occasions, but was derided for "beating a dead horse". OVEC proposes, once again, the body burden criteria be kept in the rule, but updated to agree with the state's risk standard of 1/1,000,000. In addition, **OVEC proposes to add EPA's "back-calculation" method to the rule, with the following improvements:**

(1) Default values for DOC and POC be included. There may be sufficient data available to adopt default values. DOC and POC data sets are largest for some of the more polluted rivers, i.e. Ohio, Kanawha, etc.

(2) Default values for Bioaccumulation Factors (BAFs) can be derived from default DOC and POC values, and default Kow values in table F-2.

(3) OVEC has generated default BAFs for West Virginia waters and proposes the enclosed version of Table F-2. A "back-calculation" can now be made very easily, simply by dividing a fish lipid concentration by a default BAF.

(4) "High volume sampler" and "semi-permeable membrane" methods of detecting toxic trace amounts of dioxins and other contaminants in our rivers were discussed by the Body Burden Committee. These methods should be adopted by the state in order to precisely measure "end-of-pipe" water quality for compliance monitoring, as well as

"background" conditions. These new methods may finally allow us to know whether or not permit limits are being met.

In 1994 USEPA issued a draft "National Guidance for the Permitting, Monitoring, and Enforcement of Water Quality-based Effluent Limitations Set Below Analytical Detection / Quantitation Levels". This guidance document was drafted to establish as national policy a bogus regulation to benefit dischargers of bioaccumulative toxics such as dioxin. Instead of encouraging the development of new detection methods, this policy promoted the continued use of the outdated methods.

Its purpose was to establish as standard practice the reported of "non-detection" as "zero". Worse yet, even if the contaminant were positively detected (up to three times the old detection limit), it could still be reported as "zero". (An attempt was made by the West Virginia Manufacturers Association in the last session of the West Virginia legislature to codify this "non-detect equals zero" falsification of records.)

EPA's 1994 draft guidance promised it was an interim measure, until new detection methods were developed. We now have new detection methods. Will they be used?

OVEC proposes adding section 8.5 C to the state's rule to provide for compliance monitoring of Bioaccumulative Contaminants of Concern using the "High Volume Sampler" and "Semipermeable Membrane" methods, at least on the streams or rivers which are impaired by those contaminants.

(5) **OVEC proposes section 8.5 a. of the rule to read "Bioaccumulative Chemicals of Concern (BCCs)", rather than "parameters of concern".** BCCs should also be defined in the rule. The state of Ohio has adopted the Great Lakes definition. West Virginia should also. OVEC's representative asked the body burden committee to consider adopting all twenty-two (22) BCCs on the current lists, rather than West virginia's seven (7). The committee adopted only one more, hexachlorobenzene. **OVEC proposes adopting all 22 BCCs into the rule.**

(6) Last year USEPA agreed to an out of court settlement of a suit brought against it by OVEC, et al. Now EPA may be trying to back out of its settlement. The suit was in regard to the state's and EPA's failure to implement key provisions of the federal Clean Water Act. According to the agreement, the state would develop Total Maximum Daily Loads (TMDLs) for rivers and streams where certain contaminants (i.e. dioxin, etc.) have been shown to exceed the state standard. If the state failed to develop TMDLs according to an agreed upon schedule, then EPA would be required to do so.

The Ohio and Kanawha Rivers have been shown to exceed the state's Body Burden Criteria for dioxin. As a consequence of the lawsuit, the EPA and the state have agreed to quickly develop TMDLs for dioxin in these rivers. The TMDL process can not be accomplished without measuring contributions from point sources (permitted discharges). **Are the USEPA and the state now conspiring with industry to throw out the Body Burden Criteria and disallow use of new detection methods at permitted discharges, in an attempt to free themselves from their responsibility for complying with the Clean Water Act?**

(7) The public generally perceives national as well as state level politics to be driven by moneyed interests rather than an interest in serving the public. Members of OVEC agree.

Politicians who support scientifically unfounded weakening of water quality regulations or other environmental standards no doubt do so to repay the wealthy individuals and multi-national corporations who keep them in office. These politicians and their appointees misrepresent the political will of the public, and instead assume the political will of the campaign contributors. The voices of thousands of citizens with legitimate concerns but no political clout (i.e. big campaign contributions) cannot be heard over the din of highly paid industry lobbyists.

In view of the current political system, it is extremely doubtful that the new detection methods proposed for measuring background levels of contaminants, will be used for compliance monitoring. It is also doubtful that the Body Burden Criteria will remain in West Virginia's Water Quality Standards, even though they can easily be set to the same risk level as the other standards, and even though they can be more readily implemented than the other standards.

Industry's paid consultant and our "public servants" voted in the committee to delete these criteria. These same committee members also voted against using the new detection methods for compliance monitoring.

Industry, USEPA and the state agencies have agreed. They do no want to begin precisely measuring (and then regulating) sources of dioxin and other chemicals which pollute the state's rivers and the fish that live in them.

Table F-2: Log Kow and Baseline BAFs for Bioaccumulative Chemicals of Concern, with Default Dissolved Fractions and Default Human Health BAFs

Bioaccumulative Chemicals of Concern	Log Kow	Trophic 4 Baseline HHBAFs	Default * fd values Major Rivers	Default *** HHBAFs Major Rivers	Default ** fd values Headwaters	Default *** HHBAFs Headwaters
aldrin	6.5	4.6 E 6	31%	1.4 E 6	40%	1.8 E 6
chlordane	6.0	6.2 E 6	59%	3.7 E 6	68%	4.2 E 6
DDT	6.4	6.0 E 7	34%	2.1 E 7	43%	2.6 E 7
dieldrin	5.2	1.9 E 7	90%	1.7 E 7	93%	1.8 E 7
endrin	5.1	2.5 E 5	93%	2.3 E 5	95%	2.4 E 5
hexachlorobenzen	5.6	2.5 E 6	78%	2.0 E 6	84%	2.1 E 6
"PCBs"	6.5	1.2 E 8	31%	3.6 E 7	40%	4.8 E 7
2,3,7,8 TCDD	7.0	9.0 E 6	12%	1.1 E 6	17%	1.5 E 6
toxaphene	5.3	2.2 E 7	87%	1.9 E 7	91%	2.0 E 7

* Default values for fd for Major Rivers are based on Kow for BCC, as well as DOC and POC values typical for the Ohio, Kanawha and Shenandoah Rivers (DOC = 3.0 ppm, POC = 0.4 ppm)

** Default values for fd for Headwaters are based on Kow for BCC, as well as DOC and POC values typical for the New River and miscellaneous tributaries (DOC = 1.8 pm, POC = 0.3 ppm)

*** Defalut values for HHBAFs in WV Waters are based on Trophic Level 4 Baseline BAFs, as well as Default values for fd

Source of typical DOC and POC values:
Listing of DOC and POC ("SOC") values from WV Branch of USGS, 1997

July 7, 1997

To: Environmental Quality Board
1615 Washington Street East, Suite 301
Charleston, W.V. 25311-2126

Fr: Margaret Janes D.V.M.
Potomac Headwaters Resource Alliance
HC 67 Box 27aa
Mathias, West Virginia 26812

RE: Triennial Review of Water Quality Standards

The Potomac Headwaters Resource Alliance respectfully submits these comments regarding the review of water quality standards.

Definition of Non Point Sources

We support definition 2.12.

Fecal Coliform Standard

We strongly support the proposed modification of the standard as indicated in 8.12. While we agree with the West Virginia Farm Bureau that the sources of fecal contamination of our waters need to be differentiated, availability of current data and resources make it extremely unlikely that adequate and affordable parameters will replace fecal coliform as the standard in the near future. We view any delay in modifying the current standard as a threat to public health, since fecal coliforms are a useful indicator of recent fecal pollution, (1, p.19). In fact, this indicator may underestimate the presence of certain protozoan pathogens such as Giardia and Cryptosporidium (2, p.3) and viruses (1,p.22).

We strongly contest the Farm Bureau's assertion that non-human sources of manure do not pose a human health risk. The zoonotic capabilities of numerous organisms found in animal manures is well documented (3, Chapter 3 and 4; 4, p.24; 5, p. 10, 27, 29; 6, p. 2-29; 7, p.740, 742). Some of these organisms are *Giardia, Cryptosporidium, E. Coli O157, Salmonella, Camplobacter, Staphlococcus, Streptococcus, Mycobacterium,* and *Cornybacterium.* These organisms also challenge the capabilities of drinking water treatment plants and potentially increase the risk of water borne disease (5, p.27), both from drinking water and recreational use.

Surface waters are the source of drinking water for many West Virginia communities. Drinking water plants across the State use our rivers 365 days a year. West Virginia needs a fecal coliform standard that protects public drinking water supplies to the greatest extent possible in many different flow conditions

Sources

1. "A Global Decline in Microbiological Safety of Water: A Call for Action", American Academy of Microbiology, 1996.

2. Correspondence from W. S. Herold, Assistant Director, Environmental Engineering Division, State of West Virginia Department of Health and Human Resources.

3. Cryptosporidium and Cryptosporidiosis, Edited by Ronald Fayer, CRC Press, Boca Raton Florida, 1997.

4. "Bacterial Foodborne Disease", An Economic Research Service Report, USDA, Agricultural Economic Report Number 741.

5. "Potomac Headwaters Land Treatment Watershed Project Environmental Assessment", prepared by Potomac Valley Soil Conservation District, West Virginia Soil Conservation Agency, and USDA Natural Resources Conservation Service, June 1996.

6. "Poultry Manure Management" Draft Executive Summary, USDA Agricultural Research Service, Beltsville, Md. 1995

7. Infections of the Gastrointestinal Tract, Edited by M.J. Blasser, P.D. Smith, J.I. Ravdin, H.B. Greenberg, and R.L. Guerrani, Raven Press, New York, 1995, Chapter 52.

Environmental Quality Board
46CSR1
"Requirements Governing Water Quality Standards"

Response to Comments
Amendments Made
Reasons for the Amendments

August 1, 1997

Rationale Document
46 CSR 1
Requirements Governing Water Quality Standards
August 1, 1997

This document describes the changes proposed in the Water Quality Standards rule . For each proposed change, the following are provided: a description of the existing rule; the change proposed by the Board; the comments received on the proposed amendment; the Board's response to the comments; and the final action taken by the Board on the proposed change.

Please note that the Board received a number of written comments on sections of the rule for which no change was proposed. The Board recognizes the importance of many of these comments. However, in order to provide proper public notice of amendments to the rule, the Board must limit its actions to issues which were identified in the amendments filed in the June 18 notice to the Secretary of State. The Board will make every effort to address these comments during the next triennial review, or before if appropriate.

SECTION 46-1-2 Definitions

Section 2.22.

Existing Rule

This section provides a definitions for the terms "natural" or "naturally occurring" as used throughout this rule.

Proposed Changes

The Board proposed changing the definition of "natural" or "naturally occurring" in response to comments by USEPA regarding the existing exemption from numeric water quality standards for waters where the natural background concentration exceeds the numeric standard or criterion. (See section 7.2.c.4.) The change proposed in this section is to delete the words "by any person" and replace them with the words "from any point source or non-point source". This change is intended to clarify that contributions to a stream from point and non-point sources are not considered naturally occurring. (Note discussion of amendments at section 7.2.c.4.)

Comments Received

One commenter suggested that the new language be qualified to apply to only point and non-point sources "for which an owner or operator can be identified."

The Board believes that the qualifying language suggested by the commenter is not necessary in this section. The question at issue is whether the concentration in the stream is from a natural source or a human caused source. If the concentration is linked to a human caused source, then the exemption would not apply and the appropriate water quality criteria would be imposed. The identity of the owner or operator causing the source is not relevant to that determination. Further, it is likely that in most cases the determination will be based on identity of a human caused source and that the owner or operator will be known. However if the high concentration is known to be human caused

from some old source for which no operator or owner can be identified, the concentration would still not appropriately be classified as naturally occurring therefore reliance on the exemption would be inappropriate.

Note: see discussion at §7.2.c.4 for more comments.

Board Action

Language adopted as proposed.

SECTION 46-1-5 Mixing Zones

Section 5.2.8.6

Existing Rule

The existing rule provides general criteria for establishing mixing zones in National Pollutant Discharge Elimination System (NPDES) permits.

Proposed Changes

The Board proposed a new provision at §5.2.h.6 which prohibits mixing zones from overlapping any ½ mile zone above a drinking water intake (see section 7.2.a.2). This change was proposed in response to a request by the Office of Water Resources of the DEP to clarify the intent of the mixing zone provisions regarding this issue.

Comments and Responses

The Board received several comments indicating that the existing prohibition of overlap of a mixing zone with a drinking water intake (see section 5.2.d) provides sufficient protection and that the proposed change is unnecessary. Several other commenters supported the change, stating that the ½ mile rule is intended as an area of extra protection above a drinking water intake and that a prohibition on overlapping mixing zones is fully consistent with that approach.

The Board agrees with the commenters who support this change. The Board believes that the proposed prohibition is consistent with the intent of the ½ mile rule. The ½ mile rule requires that discharges in the zone above drinking water intakes meet water quality criteria at the end of the discharge pipe rather than allowing a mixing zone in that area. The proposed prohibition would similarly disallow concentrations from an upstream mixing zone to cause an exceedence of the water quality criteria in the ½ mile zone.

Board Action

Amendment adopted as proposed.

SECTION 46-1-6 Water Use Categories.

Section 6.3.b

Existing Rule

This section of the rule establishes and defines water use category B3, small nonfishable streams.

Proposed Changes

The Board proposed removing Category B3, small non-fishable streams, from the rule and incorporating those waters into Category B1, warmwater fisheries. This change was proposed based on recommendations by USEPA and US Fish and Wildlife Service (USFWS). In addition to the removal of the B3 category the Board proposed amendments to the description of the B1 use category to clarify the scope of that category.

Those two agencies have had a longstanding concern that the distinction of the B3 use category from the B1, warmwater fishery category, seems to indicate that the B3 streams which do not support sport fisheries may be subject to different, less protective criteria or levels of antidegradation protection than those that do.

Comments and Responses

Several commenters stated that the removal of the B3 use is unnecessary because the numeric criteria associated with the B3 use are the same as the B1 use category. They also argued that B3 is a subcategory of the B1 category and that establishing use subcategories is appropriate and fully supported by EPA guidance documents.

The Board recognizes that use subcategories are authorized by EPA guidance and may be useful in certain instances. However, the Board was persuaded that at this time the B3 category can be appropriately incorporated into B1 to ensure full protection of those waters. If circumstances arise in the future which warrant establishing a use subcategory for a specific purpose, the Board can revisit the issue.

In addition to deleting the B3 use category the Board proposed further amendments to the B1 category to clarify its scope and ensure sufficient protection of aquatic life.

Board Action

The Board adopted the removal of category B3 as proposed. They amended the description of category B3 to read as follows: "Streams or stream segments composed of all warmwater aquatic life."

SECTION 46-1-7 West Virginia Waters.

This section includes a list of the major river basins in the state, describes the applicability of the water quality standards to waters of the state and includes a list of site specific criteria, variances and designated use reclassifications.

The Board undertook a comprehensive review of all of the variances, site-specific numeric criteria and use redesignations which are found in this section. Many of the existing variances had been adopted in the mid- to late 1980s and had not been reviewed since their incorporation in the Water Quality Standards rule. In EPAs most recent review of the rule, they disapproved all of the variances in this section pending rejustification of the original values. The Board worked with EPA, the Office of Water Resources of the WVDEP and the affected permittees to conduct reviews and determine the appropriateness of each variance.

Section 7.2.4.c.

Existing rule

This section provides an exception to the application of numeric criteria to waters where the naturally occurring concentrations of a parameter exceed the numeric criterion for the parameter. In that instance, the rule provides that the naturally occurring value becomes the water quality standard.

Proposed Changes

In an effort to respond to concerns raised by EPA the Board proposed adding language to this section to clarify that the naturally occurring values shall be the applicable criteria only where the existing and designated uses of downstream waters are not adversely affected by such values. In addition to the change in this section, the Board proposed changes to the definition of naturally occurring (section 2.11) which clarifies that contributions from point and non-point sources are not considered naturally occurring conditions.

Comments Received

EPA commented that the provision as written establishes an alternate numeric criterion without providing an opportunity for public notice and comment. They also suggested that other appropriate methods are available for establishing alternate criteria, such as the development of Total Maximum Daily Loads (TMDLs), site specific numeric criteria, variances or redesignation of designated uses.

The Board acknowledges that this exemption may establish an alternate criterion without opportunity for public notice. To address that, the Board has discussed with the Office of Water Resources (OWR) of the WV Division of Environmental Protection (DEP) the possibility of providing notice of reliance on this exemption in the public notice in any draft permit in which the exemption is used to develop effluent limits. The OWR has stated that they are willing to provide such notice. The Board will continue to work with the OWR and provide assistance when such an

issue arises in a permit.

Some commenters, including the OWR, suggested that guidance be developed to assist in making the determinations regarding whether a concentration is from a naturally occurring source and in determining the appropriate concentration value. The Board agrees implementation guidance would be helpful and will work with OWR to begin to develop such guidance.
See comments at 2.11.

Board Action

Amendments adopted as proposed.

Section 7.2.d.2a.

Existing Rule

This section includes a variance for fluoride in the unnamed tributary of the South Branch of Buzzard Run above and below Prather Pond. This exemption was granted to Corning Glass Company in the late 1980s.

Proposed Changes

The Board proposed removal of this variance. During the recent review, the Board determined that for the past several years the company's discharge has been meeting the human health criterion for fluoride and in fact the permit no longer includes an effluent limit, but requires "monitor only" for fluoride. Based on the permit status both the Office of Water Resources of the DEP as well as EPA recommended removing the variance.

Comments and Responses

EPA and OWR indicated support for this change. Corning Glass indicated that if a future need arises to reapply for a variance for this parameter that they be allowed to do so. The Board supports the request of Corning and will work with the company and OWR and EPA if a need arises in the future.

Board Action

Amendment adopted as proposed.

Section 7.2.d.6.1

Existing Rule

This section includes a variance for temperature in the Stony River granted to Virginia Power Company.

Proposed Changes

The Board proposed an amendment to the language describing the length of the application of the variance to state that it extends from the limit of the thermal mixing zone (as established by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to the USGS gaging station at the Rt. 50 Bridge. In addition, the Board proposed that the exemption from the application of the standards would apply until the successful completion of a "316(a)" review or May 30, 1998, whichever comes first.

The Board proposed the change regarding the 316 (a) study after reviewing this variance with the assistance of EPA and OWR. As a result of the review, the agencies determined that the most appropriate mechanism for addressing this thermal variance is through the 316(a) review procedure outlined in the federal Clean Water Act. The proposed amendments to this section reflect that determination.

The proposed change in the length of the variance was made at the suggestion of Virginia Power.

Comments Received

The company submitted comments stating that they are in the process of preparing a preliminary work plan for conducting a 316(a) review in the stream. Based on that, they requested that the May 30, 1998 date be deleted and that the language they had proposed limiting the length of the application of the variance be deleted.

The Board believes that establishing a deadline in the rule for completion of the 316(a) study is important to ensure that the variance is not retained in the rule any longer than it is needed. Upon completion of the 316(a) review, the alternate temperature limit will be placed variance in the permit, and will be removed from this rule. EPA has made clear that a deadline for completion of the study is necessary for them to remove their current disapproval of this section. After some discussions with the company and OWR representatives, the Board agreed to extend the deadline from May 30, 1998 to December 31, 1998. This will provide the company an extra 7 months for completion of the study and the necessary administrative changes, which the Board feels will provide the company sufficient time. The OWR supported the change in the date.

Virginia Power also requested to retain the original language regarding the length of the variance. They made this request based on their decision to pursue a 316(a) review of the stream. They maintain that the review may result in the need for further changes in the description of the extent of the variance. The Board is hopeful that the variance length will be shortened as a result of the review, but agreed to retain the entire extent until the review is completed

Board Action

The Board adopted the original language regarding the extent of the variance which states

"from the limit of the thermal mixing zone (as established by Board Order of 11/20/75) for the Mount Storm Lake wastewater treatment facility to its confluence with the North Branch of the Potomac River. . . " and amended the last sentence to read " This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Clean Water Act or December 31, 1998, whichever comes first."

Section 7.2.d.7.2.

Existing Rule

This section includes variances for a number of parameters in an unnamed tributary to the Monogahela River which applies to discharges from the facility owned by Sharon Steel Corporation.

Proposed Changes

The Board proposed removing this variance. The basis for this decision is that Sharon Steel Corporation is now in bankruptcy and representatives from the company indicated that there are no funds available to prepare a justification for retention of the variance limits. Further, the NPDES permit has not been renewed by the OWR. The facility has been listed as a superfund site.

Comments and Responses

The company requested that the Board retain the variance because they are trying to sell the property and believe that retention of the variance would help them in that effort. Both EPA and OWR supported removing the variance limits.

The Board is concerned about the ongoing discharges from this facility. We believe that in order to retain this variance the company must demonstrate that they will be working toward meeting the water quality criteria over the next three years. It is obvious to the Board that the company is not in a position to make that demonstration at this time.

Board Action

Amendment adopted as proposed.

Section 7.2.d.8.

Existing Rule

None, this is a new provision.

Proposed Changes

The Board proposed the addition of site-specific numeric criteria on two tributaries of Daugherty Run of the Cheat River. The proposal was in response to an application filed by Allegheny Power Company. The new criteria for the unnamed tributary of Daugherty Run, approximately one

mile upstream of the confluence of Daugherty Run with the Cheat River, the new criteria are 3.5 mg/l for iron and 15.24 ug/l for selenium. For "Fly Ash Run" of Daugherty Run, the values are 888.5 ug/l for aluminum and 5 mg/l for manganese. (See information sheet attached)

Comments and Responses

One commenter critiqued the documentation filed by the company in support of these site-specific criteria. They expressed concerns about the methodologies applied in deriving the values. The guidance documents relied upon are written by EPA. The Board is awaiting the completion of EPAs review of the company's justification. The Board believe that the company has made a good faith effort to provide the supporting documentation for the proposed criteria.

Board Action

Amendment adopted as proposed.

Section 7.2.d.16.1.

Existing Rule

This section includes the site-specific numeric criteria established for the stretch of Conners Run, a tributary of Fish Creek from its mouth of the discharge from Conner Run impoundment.

Proposed Amendment

The Board proposed retaining all of the existing site-specific criteria except for arsenic. The retained values are 62 ug/l for selenium and 3.5 mg/l for iron. The proposal was based on submissions from the company which were reviewed by the Board, OWR and EPA.

Comments and Responses

OWR supports the changes. EPA commented that they are undergoing a review of the criterion for selenium. They requested that the Board include a provision in this section which states that the Board may review the selenium criterion upon completion of EPAs guidance on this parameter. The Board agrees that it may be appropriate to undertake a review of the value when new information becomes available and understand and agree with the basis for EPAs request. They believe, however, that it is unnecessary to amend this section to include that language.

Board Action

Amendment adopted as proposed.

Section 17.2.d.16.2.

Existing Rule

. This section includes variances on Harmon Creek for temperature, iron and fluoride for discharges from Weirton Steel Corporation.

Proposed Changes.

The Board proposed retaining the existing variance parameters.

Comments and Responses

Weirton Steel reiterated a request made prior to the comment period to and add new criteria for free cyanide, lead, phenols and zinc. The Board consulted EPA and OWR regarding this request and determined that these alternate criteria are consistent with provisions in a consent agreement reached with EPA and the company.

EPA and OWR supported granting Weirton's request with several conditions. The suggested that in order to retain this variance that the company must submit a report by May 30, 1999 describing the discharge concentrations for the parameters from June 1, 1998 to May 1, 1999, providing an engineering report of potential alternatives for reducing the concentrations further, providing proposals for any appropriate reductions in the concentrations of the parameters and a semi-annual report of the water quality of the discharge and the efforts made by the company to improve the quality of the discharge.

The Board agrees with the comments of these two agencies. The basis for this variance is socio-economic in nature and recognizes that immediate removal of the relaxed limits will have a negative impact on Weirton Steel and the surrounding community. However, the Board feels very strongly that improvements must be made in Weirton's discharge over the next three year period. The goal of granting this type of variance is to provide time for a facility to make the changes necessary to meet water quality standards in the future. The Board will review this variance carefully over the next three years with that in mind.

Board Action

The Board adopted language adding the new criteria with conditions.

Section 7.2.d.16.3.

This section includes a variance on Cow Creek from its mouth to a point approximately 2300 feet upstream.

Proposed Changes

Board proposed removing this variance. That proposal is based on a letter from the company indicating that due to changes in the wastewater treatment process, which included rerouting the discharge to the Ohio, that they no longer needed this variance.

Comments and Responses

EPA and OWR support the change.

Board Action

Amendment adopted as proposed.

Section 7.2.d.20.2.

Existing Rule

This section includes site-specific numeric criteria on Little Scary Creek.

Proposed Change

The Board proposed removal of arsenic value.

Comments and Responses

OWR supported the change. EPA generally supported the change but made comments regarding the selenium value that are discussed at 7.2.d.16.a. One commenter indicated that the language regarding the B3 use designation should be removed based on the Board's proposal to remove that use category from the rule.

The Board concurs with EPAs comments on selenium and will revisit the site-specific criterion for selenium upon completion of EPAs review. The Board also agrees that the reference to the B3 use category should be amended.

Board Action

Amendments adopted as proposed. Additionally, the Board amended the language to remove the reference to the B3 use category.

Section 7.2.d.20.4.

Existing Rule

This section includes an alternate temperature criterion for Simmons Creek granted to Dupont Company.

Proposed Changes

Based on the company's has agreement to conduct a 316(a) review by May 1998, the Board proposed including a provision to that effect in the rule. Upon completion of that review the existing variance will be removed.

Comments and Responses

OWR and EPA support the amendment.

Board Action

Amendment adopted as proposed.

Section 7.2.d.29.1.

Existing Rule

This section includes a variance on Laurel Creek granted to New River Mining, now Mt. Laurel Resources.

Proposed Changes

Based on submissions from the company indicating that they are in bankruptcy and that they have no resources to prepare a justification for the existing value, the Board removed this variance.

Comments and Responses

EPA supports this change.

Board Action

Amendment adopted as proposed.

Section 7.2.d.30.1

Existing Rule

This section includes a variance on the Greenbrier River granted to Howes Leather Company.

Proposed Changes

Because Howes Leather is no longer in operation and no longer retains an NPDES discharge permit, the Board proposed removal of this variance.

Comments and Responses

EPA and OWR support this change.

Board Action

Amendment adopted as proposed.

SECTION 46-1-8. Specific Water Quality Criteria

Existing Rule

This section provides information on how the water quality standards are implemented.

Proposed Changes

8.1.a. The Board proposed correction of a citation to the National Pollutant Discharge Elimination System (NPDES) regulation.

8.5. The Board proposed this new section in response to disapproval of the "body burden" criteria in section 8.22.1 and 8.22.2 by EPA during the last triennial reveiw. The Board attempted to remove the body burden criteria from the rule through emergency rulemaking, but received numerous comments in opposition to that attempt. In response, the Board convened a committee composed of USEPA, US Fish and Wildlife Service, WV Division of Environmental Protection - Office of Water Resources, WV Bureau for Public Health, WV Division of Natural Resources, West Virginia Manufacturers Association and the Ohio Valley Environmental Coalition. The committee met numerous times from November through June to develop the proposal included herein. A final report from the committee is attached.

The proposed language removes the numeric body burden criteria for chlordane, DDT, aldrin, dieldrin, endrin, toxaphene, PCB, and dioxin from the rule. All of the parameters have detection limits which are higher than the water quality criteria. In order to provide a method of determining background concentrations for these parameters, the proposal provides three options for measuring background concentrations for the parameters - a back-calculation procedure which uses fish tissue concentrations to estimate in-stream concentrations for each parameter, the high volume sampling technique and the semi-permeable membrane sampling technique. The determination of which technique to use is made by the Chief of the OWR.

Comments and Responses

8.1.a. No comments received.

8.5. One commenter supported the removal of the body burden criteria but did not support the three options. In particular, the commenter supported the use of the high volume sampling technique as being the sole method for determining concentrations of these parameters. Other commenters expressed concerns about the removal of the body burden criteria. They believe that a measure of fish tissue is a simple and accurate assessment of the condition of the stream. In addition, these commenters expressed concern about the back-calculation procedure due to use of default values for bioaccumulation factors (BAFs) and Kow values (octanol water coefficient values) they maintained that the default values chosen for use in the back-calculation procedure may not be sufficiently protective.

While the Board recognizes that this proposal may be controversial, we are persuaded that it is a strong first step in addressing the problems of measuring the parameters at issue. The committee was composed of numerous qualified people, and, while consensus may not have been

reached on all issues, the majority of the members supported this proposal. The Board intends to review this provision as it is implemented and reconvene the committee if it is deemed necessary.

Board Action

8.1.a. Amendment adopted as proposed.

8.5. Amendment adopted as proposed with minor typographical corrections.

APPENDIX E

Section 8.1 Aluminum

Existing Rule

The current criteria include the following values: 750 ug/l acute aquatic life, 87 ug/l chronic aquatic life.

Proposed Changes

The Board proposed removing the chronic aquatic life value of 87 ug/l. This proposal was made in response to a request from the Office of Water Resources. The expressed concern that background values for aluminum across the state regularly exceed the 87 ug/l criterion. Due to the high background values, a number of water treatment facilities have had problems meeting this standard.

Comments and Responses

A number of commenters supported this change. They indicated that EPAs 87 ug/l chronic value for aluminum is based on data for only two species, the brook trout and the striped bass. They maintain that the criterion is extremely conservative. Other commenters were concerned about the removal of this value. They argued that aluminum toxicity is complex and that the Board should engage in further study before removing the chronic value to ensure the protection of aquatic life.

The Board has asked the OWR to collect data on aluminum as part of their ongoing watershed assessment work. That office has agreed to collect data over the next year and work with the Board in addressing some of the issues related to aluminum. In the interim, the Board has decided to drop the chronic value - with the intention that they will revisit this issue next year, and not wait for the next triennial review.

Board Action

Amendment adopted as proposed.

Section 8.12 - Fecal Coliform

Existing Rule

This section provides limits on fecal coliform in state waters. The pertinent portion provides that a concentration of 400/100 ml cannot be exceeded in more than ten percent of all samples taken during the month.

Proposed Change

The Board proposed amending the language in this section to disallow exceedence of 400/100 ml at any time. This proposal was based on suggestions from numerous environmental organizations who expressed concerns about the ambiguity of the current language.

Comments and Responses

Several commenters expressed support of this change. They believe that the 400/100 ml concentration poses significant health risk and that it should be made clear in the rule that exceedence of that value sat any time would be considered a violation of the criterion. They are concerned that requiring more than one sample to demonstrate a violation causes the state regulatory agencies difficulty. Other commenters argued against the change. They expressed concerns that more than one sample should be required due to the possibility of exceedences based on stormwater events or other irregular occurrences.

After consideration of the comments the Board determined that amending the criterion at this time is unwarranted. They believe that as written the language can be interpreted to allow reliance on one sample for regulatory purposes if only one sample is available. They are concerned that amending the language would not be consistent with EPAs criteria document; and could result in regulatory actions not intended by the guidance document.

Board Action

Proposed amendment deleted.

Section 8.15.1 - Iron

Existing Rule

This section provides for a variance from the criteria for iron in certain circumstances.

Proposed Changes

At EPAs request, the Board proposed deletion of this section. EPA expressed concern that this section allows the establishment of alternate criteria without opportunity for public notice and comment and further that it addresses setting NPDES permit effluent limits, which is not appropriate in this rule.

Comments and Responses

EPA and OWR support this change.

Board Action

Amendment adopted as proposed.

Section 8.17 - Managanese

Existing Rule

This section establishes a chronic aquatic life criterion of 1.0 mg/l for manganese.

Proposed Change

At the suggestion of EPA and a number of commenters, the Board proposed deletion of the aquatic life values for manganese. EPAs requested deletion or justification of the value because they have developed no aquatic life values for manganese. Other commenters indicated that in certain circumstances where high manganese values occur, that treating to remove the manganese is expensive and causes a negative environmental impact.

Comments and Responses

A number of commenters supported this change. Some commenters suggested that the Board amend the human health criterion to reflect EPAs current Public A category criterion.

The Board believes that the current human health value is consistent with the drinking water limit for manganese.

Board Action

Amendment adopted as proposed.

8.17.1 Manganese

This section provides a variance similar to the one described in the iron section, above

Proposed Change

The Board proposed removing this section. (See discussion in iron section, above.)

Comments and Responses

EPA and OWR support the change

Board Action

Amendment adopted as proposed.

Section 8.19 - Nickel

This section provides criteria for nickel to apply to the state's waters.

Proposed Changes

At EPAs suggestion, the Board proposed removing the trout water value of 50 ug/l.

Comments Received

EPA supports this change.

Board Action

Amendment adopted as proposed.

Section 8.22 - Organics

Proposed Changes

Aldrin - At EPAs suggestion, the Board proposed deletion of the chronic aquatic life value for aldrin.

Chloroform - At EPAs suggestion the Board proposed amending the chronic aquatic life value from 15.7 to 1,240 ug/l.

1,1,2,2- tetrachloroethane - At EPAs suggestion, the Board proposed amending the chronic aquatic life value from 10.7 to 2400.

Comments Received

EPA and OWR support the changes.

Board Action

Amendments adopted as proposed

Section 8.24 - Phenolic Materials

This section includes values of 5 ug/l for aquatic life and human health categories.

Proposed Change

At EPAs suggestion, the Board proposed amending the existing aquatic life values to reflect EPAs gold book values for phenol.

Comments and Responses

Some commenters suggested amending the human health value for phenol to reflect the gold book value as well. The Board agrees with this suggestion.

OWR suggested that the old values for phenolic materials be retained along with the phenol values. The Board is reluctant to do so because of the lack of information about the values for phenolic materials. The Board will work with OWR to address this concern in the future.

Board Action

Amendment adopted along with adoption of a value of 3.5 mg/l for category A waters.

Section 8.31 - Total Residual Chlorine

This section provides human health criteria for total residual chlorine of 10 ug/l.

Proposed Change

At the suggestion of the OWR, the Board deleted the human health values. The basis for OWRs suggestion is that water treatment plants use chlorine for disinfection purposes and often are unable to meet this value. Further EPA has no human health criterion for chlorine.

Comments and Responses

OWR and EPA support this change.

Board Action

Amendment adopted as proposed.

Section 8.33 - Zinc

This section includes Public A category values for zinc.

Proposed Change

In comments similar to those at section total residual chlorine, above, OWR suggested removal of the human health values for zinc. Zinc orthophosphate is often used for disinfection by water treatment facilities, resulting in difficulty meeting the criterion. EPA has no human health values for zinc.

Comments and Responses

OWR and EPA support this change

Board Action

Amendment adopted as proposed.

ENVIRONMENTAL QUALITY BOARD

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

Telephone: (304) 558-4002
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August 28, 1997

Judy Cooper
Administrative Law Division
Office of the Secretary of State
Building 1, Suite 157 K
1900 Kanawha Blvd., E.
Charleston, WV 25305-0770

RE: 46 CSR 1, Requirements Governing Water Quality Standards

Dear Ms. Cooper:

Enclosed is a copy of the transcript from the public hearing held on proposed changes to the Water Quality Standards rule which were filed in your office on August 1, 1997. We indicated in the document filed that the transcript would be forwarded to you when we received it from the court reporter.

Fifteen copies will be forwarded to the Legislative Rule-Making Review Committee.

Thank you for your consideration of this matter. Please do not hesitate to call me if you have any questions.

Sincerely,

Libby Chatfield
Technical Advisor

ORIGINAL

ENVIRONMENTAL QUALITY BOARD

STATE OF WEST VIRGINIA

Transcript of a public hearing to accept comments on proposed amendments to legislative rule 46 CSR 1, Requirements Governing Water Quality Standards, and 46 CSR 12, Requirements Governing Groundwater Standards, held at 1615 Washington Street, East, Charleston, West Virginia, on Monday, the 21st day of July, 1997, at 7:00 p.m..

BEFORE: DONALD C. TARTER

LIBBY M. CHATFIELD, Technical Adviser

REBECCA S. CHARLES, Legal Adviser

INDEX OF SPEAKERS

MS. CHATFIELD: Welcome, this evening.

My name is Libby Chatfield and I'm the technical adviser to the Environmental Quality Board.

And we have with us tonight one Board member, Doctor Don Tarter, who teaches at Marshall University.

And we've had various other problems with the others, so this is it.

And we also have with us Becky Charles, who is counsel to the Environmental Quality Board.

I didn't differentiate on the sign-up sheet between the water quality standards and the groundwater. So I think what we'll do is take the water quality standards first, let everybody comment that wants to, and then pick up on the groundwater standards. And if people have to come back up, we'll do it that way.

The first person that we have on the list is Steve White from the ACT Foundation.

(WHEREUPON, a discussion

was had off the record.)

MR. WHITE: My name is Steve White. I'm director of the Affiliated Construction Trades Foundation.

We've already presented written comments.

MS. CHATFIELD: Yes. We got them.

MR. WHITE: So I have very little to add on top of that other than to emphasize our concern, particularly with this proposed pulp and paper mill, over this change with the body burden measurement. We see nothing in this proposed change but to weaken standards. We easily could do what EPA has asked to make it in line with their standards by just doing just that and keeping our water quality standards.

It's all in the document. I'm just here to emphasize that we're concerned about the pulp mill. We're concerned about this as one of a long line of attempts to lessen the standards in this state to accommodate a company that probably isn't even here today, although I'm sure their representatives legally are here.

So that's the extent of my comments.

MS. CHATFIELD: Thanks.

Next we have Tom Purcell.

DR. PURCELL: Actually you have our comments as well. We sent them in in January.

My name is Doctor Thomas Purcell. I'm an aquatic environmental scientist with a group called the Silver Council. In the past, I've worked as director of environmental policies for the printing industries of America. I also worked for EPA for five years writing water quality criteria standards.

The Silver Council represents the manufacturers and users of photographic materials; for those of you who have been trying to guess exactly what the Silver Council did. Dentists, veterinarians, doctors, hospitals, photographers, printers, and all that types of thing, police departments, all use silver-containing photographic materials.

After processing and silver removal, typically some residual silver in the parts per billion and parts per million range, may remain in the fixer waste that's disposed of, in about ninety-five percent

of the cases, into sewage treatment plants.

The Silver Council has reviewed the proposed amendments and obviously we have placed specific focus on silver, which is our interest, but some of the comments that we have made sort of flop over into other metals as well.

We find that the comments that we supplied you on January 31, 1997, resulted in no changes to the proposal. And we would like to once again encourage changes so that you fall more in line with what the EPA guidelines are.

The proposed standards, for example, continue to call for the use of total recoverable metals. The EPA, for the past four to five years, has recommended the use of dissolved metals as a more accurate rendition of what is biologically available to the organisms in the stream. And we would encourage the use of dissolved metals as opposed to total recoverable.

Silver happens to be sort of an interesting issue in that only one form of silver is toxic to aquatic organisms to any great extent and

that's the ionic form. And nothing could measure or nothing could be more conservative than total recoverable. In other words, total recoverable measures all the silver that exists. And the vast majority of that is not at all toxic. So it's a highly conservative way of going about things.

The EPA in fact, as I said, has issued guidance that they would prefer the use of dissolved metals as a translator that's built into their guidance that converts from total recoverable to dissolved. And their suggestion is that you use dissolved.

The second issue that we had and was included in our comments is the use of, the continued use of the chronic values which are again not recommended by EPA.

So we would like to reemphasize one more time that perhaps these chronic values that are being proposed could just be deleted. EPA would have no particular objection. The environment would not suffer. And people who do photo processing would be benefited because calculations of waste loads of POTWs

using chronic values typically drives the number below what can be achieved in removing silver. It also drives the number in many cases below what you can actually measure in the environment.

So for those reasons, we encourage the Board to go back and reconsider their proposals and perhaps change those proposals to come more in line with what EPA recommends.

Thank you.

MS. CHATFIELD: Thank you.

Leonard Knee.

MR. KNEE: Let me go ahead and give you these comments.

Like the previous speakers, I don't have a lot of comments orally to make. They're principally contained in the written comments that we have just submitted to the Board. I just simply want to touch on a couple of things and let the Board consider principally the written comments that we've just submitted.

My name is Leonard Knee. And I'm here tonight making these comments on behalf of Century

Aluminum Corporation, which most of you know more familiarly as Ravenswood Aluminum Corporation.

Century Aluminum supports the Board's decision to delete the chronic aluminum criterion. We have in our comments provided a more specific outline of what we believe to be the technical deficiencies in EPA's chronic aluminum criterion. Century also supports the Board making certain changes to the acute aluminum criterion. And we have also provided what we believe would be sufficient technical justification for the Board making a change to the acute aluminum criterion as well.

We don't have any greater comments than what are contained in the written comments made to you. And we appreciate the opportunity to participate and make these comments.

MS. CHATFIELD: Thank you.

Next is Cindy Rank.

MS. RANK: I'm Cindy Rank with the West Virginia Highlands Conservancy. And we would, as usual, like to reemphasize our support for the Department of Health's encouragement of stronger

manganese standards, stricter manganese standards for drinking water, also for Water Resources' encouragement about restricting a one-half-mile zone and not allowing mixing zones within that one-half mile drinking water intake, and several other of the aluminum comments by Fish and Wildlife, as well as several other Water Resources comments.

The one issue that we've talked about at a couple of these meetings and we still remain especially concerned about, because it doesn't seem to have a cut and clear answer, is the manganese question. And you'll hear a lot, I'm sure, from the folks that I see tonight in the audience about how manganese is not toxic to fish.

And I would hope that the Board considers the other ramifications of eliminating manganese standards from the waters of the state. If you look at-- What troubles me most is the gold book guidance from EPA, which I think postdates the red book, which is countered by a lot of the coal industry's comments that I've read. The gold book seems to indicate that perhaps manganese is not toxic

to fish. But there may be a lot of other problems associated with it. It also doesn't appear naturally in concentrations usually over one milligram per liter. It also is not treatable by conventional treatments.

And so that if we're not careful with the manganese standards in our surface water intakes or the surface waters that are available for public water intakes, small communities, individual communities, the conventional treatment systems do not eliminate manganese. So that if we keep allowing more manganese to occur in our surface waters that might be used for drinking water category A, then we're passing treatment costs on to people who wouldn't normally have to pay that. And so I'm concerned that if in fact to placate one industry's problems with treating manganese or treating manganese on site, we will also be putting a greater burden on people downstream who may be using the waters for their own use, for their own purposes.

I don't think it's unrealistic to think that a lot of people in the hills and hollows of West Virginia have smaller treatment plants than water, say, in Buckhannon or in Charleston. And no matter

where you are, whether you have an individual treatment yourself or a small community, apparently conventional treatment systems don't deal well with manganese and so you have a constant staining and a smell.

And what happened in Buckhannon back in the late '80s, the curdling of your coffee if in fact the water is too hard, or the manganese in the process of trying to reduce the hardness, the combination of manganese and iron causes problems. It's not a clear-cut answer to this. I just hope that the Board looks at more than just the relief of treatment costs for one particular industry when you're considering the ramifications of eliminating or reducing the manganese standard.

And also considering, of course, I think you have to make clear that the Board, as it said in several of its findings in different hearings, that all water uses are considered basic to all waters of the state unless proven otherwise, which would mean that category A would apply to most streams in the state, unless whatever operator would want to prove that in fact it was not being used or could not be used

for a domestic water intake or a private water intake.

So I would just, without any solutions to any of these things tonight, I would ask you all to consider more than just the cost of treatment by one industry that has problems with eliminating manganese from their discharge. There are answers I think that apply. They may be costlier to the particular companies but they are less problematic for the rest of the state if in fact they are dealt with on site.

Thank you.

MS. CHATFIELD: Thank you.

Dave Yaussy.

MR. YAUSSY: My name is Dave Yaussy. I am here on behalf of the West Virginia Manufacturers Association this evening.

The WVMA will be filing its written comments tomorrow. But there are a few areas that we would like to emphasize tonight if we could.

The first of these issues is the application of category A use in West Virginia. We believe that the Board has a unique opportunity to

clarify the application of the category A use throughout the state in a way that allows the Office of Water Resources to protect public water supplies while not imposing unnecessary conditions on discharges. The Board could do this by clarifying the category A use of described streams that are used for public water supplies. And that the use will be protected even if current dischargers must accept additional restrictions, including permit limits where necessary, to protect the use. However, where there is no public intake to be affected, the category A use would not apply and permits could be written without limits based on the category A criteria.

This clarification by the Board would serve two purposes. It would clarify that the category A use applies everywhere an intake is located and thereby provide protection for the water supply. It would also allow dischargers the option of showing that no intake is located downstream or so far downstream that it could not be affected by the discharge. It would allow permittees to avoid imposition of limits to protect human health when there is no one drinking the

water.

An example of this problem is pointed out by the change in the manganese criteria. The West Virginia Mining and Reclamation Association did an excellent job of explaining why there is no need for a limit on manganese to protect aquatic life. One of the advantages of dropping the category B manganese criterion is the elimination of unnecessary treatment, treatment that in some cases will cause more environmental detriment than the manganese itself. These mining discharges are generally found on small streams that are far from public water intakes and they have no effect on public water supplies. Nevertheless, unless the Board clarifies its rule, the same counterproductive treatment must continue to meet the category A limits even though there is no category A use to protect.

The other issue that the WVMA would like to highlight this evening is the fish body burden criteria. We strongly support the Board's proposal for eliminating the criteria at 8.22.2 and we appreciate the opportunity to have served on the study group that

made that recommendation. As we have stated on several occasions though, the body burden criteria are simply unworkable.

We have some concerns about the change that the Board intends to make in its stead though. For one thing, the Board's proposal sets forth three different ways of calculating water column concentrations when the criteria are below the minimum detection limit. Those are back calculations for fish tissue, lipid limits, and high volume sampling. The Board makes no provision for reconciling differing results among those different methods.

Furthermore, we are concerned about the use of bioaccumulation factors that were developed for the Great Lakes initiative and not specifically for state waters. We suspect that with experience with high volume sampling, we will learn that it is the most accurate and reliable means of measuring water column concentrations.

We suggest the Board wait until EPA has the opportunity to review its experience with that sampling technique and then propose it as a method for

evaluating substances at levels below the water quality criteria.

Thank you.

MS. CHATFIELD: Thank you.

Mark Vignovic.

MR. VIGNOVIC: Good evening. My name is Mark Vignovic and I'm manager of environmental controls for Weirton Steel Corporation. We've already submitted tonight written comments. But I wanted to just reemphasize some of the things we would like to see with the revisions.

Weirton Steel owns and operates an integrated steel mill that's located on the banks of the Ohio River in Weirton, West Virginia. Weirton Steel is the largest single taxpayer in the State of West Virginia and employs approximately fifty-two-hundred people.

The company withdraws millions of gallons of water per day from the Ohio River for use in the mill. This water is used and treated for a variety of purposes, including contact and noncontact cooling water, air pollution control makeup water, and drinking

water. Some of this water is recycled and reused in the mill. The remainder is discharged to three process outfalls in the Ohio River through outlets 002 and 003 and Harmon Creek through outlet 004.

Weirton Steel has submitted written comments this evening on three specific areas of the proposal. They are, number one is the site specific water quality standards for Harmon Creek. Number two is the criteria for phenolic materials. And number three was the applicability of the half-mile rule to a short section of the Ohio River.

I'd just like to take a few minutes to summarize our comments. First, regarding the site specific water quality standards for Harmon Creek. Weirton Steel's discharge at our outlet 004 is subject to site specific water quality standards for three parameters: iron, temperature, and fluoride. These site specific standards were enacted by the Water Resources Board and the legislature in the mid-1980s.

By letter earlier this year, on January 8, 1997, EQB had requested that Weirton Steel provide new information to support these standards.

Shortly thereafter the Board also entered a consent order and agreement which imposed new and more stringent effluent limitations for several parameters, lead, zinc, phenols, and free cyanide, at outlet 004, which will become effective in June of 1999.

After a series of conference calls earlier this year between representatives of Weirton Steel, the Board, the Office of Water Resources, and the U. S. EPA, it was agreed that Weirton would submit study reports to support the existing site specific standards for iron, temperature, and fluoride and new site specific standards for iron or for lead, zinc, phenols, and free cyanide. These studies were undertaken on an accelerated basis and resulted in three reports, all of which have been submitted to the Board.

The three reports are the socioeconomic study which evaluated the cost of compliance with the relevant statewide criteria and the resulting impact on the Weirton-Steubenville area. The second was the drinking water use survey which evaluated the applicability of the category A standard

for Harmon Creek. And the third study was the 316A study which evaluated the impacts of the existing thermal discharge on Harmon Creek.

Based on these reports, Weirton Steel has requested site specific revisions to the water quality standards for Harmon Creek for free cyanide, lead, phenols, zinc, temperature, iron, and fluoride. We believe that the reports amply demonstrate the basis for this request and would support the enactment of section 7.2.d.16.2 of the proposal in that it maintains the existing site specific standards for iron, fluoride, and temperature. However, for the reasons set forth in our written comments, it should also be modified to provide for the site specific requested standards for lead, zinc, phenols, and free cyanide.

Our second set of comments revolves around the phenolic materials criteria. As a major discharger on the upper reach of the Ohio River, Weirton Steel has long been concerned about the across-the-board criteria of five parts per billion for phenolic materials, particularly when these criteria are compared to the much less stringent criteria of

Pennsylvania and Ohio.

Weirton Steel expressed the basis for these concerns in its written comments dated March 31st and its verbal comments during public meetings of June 3rd and June 13th.

We commend the Board for addressing this issue during this review of the water quality standards and for attempting to conform its standards with EPA's criteria. However, Weirton Steel believes a few additional changes are necessary to achieve the goal expressed by the Board during its meeting of June 13th. As set forth in the Board's comments, there are two different standards of EPA criteria for phenol and those set for phenols or phenolic materials. Although there are no clear reasons for the apparent discrepancies between the two sets of EPA criteria, they do reveal several important points. The first is, all the criteria are for phenol, which is just one of several phenolic materials, and has all the criteria or orders of magnitude greater than the existing West Virginia Water Quality Standard of five parts per billion. There is no legitimate scientific or

regulatory basis for the five-part-per-billion standard.

The second concern is the appropriate parameter for regulation in the Water Quality Standards as phenols or phenol and not phenolic materials. Weirton Steel recommends that the Board continue to apply the aquatic values in the proposal but the Board change the proposed parameter from phenolic materials to phenol. We also recommend that the Board replace the five-part-per-billion phenolic materials criteria for category A to the EPA criteria value of twenty-one-thousand micrograms. These revisions will result in conservative scientifically-based limits for phenol in the waters of West Virginia while at the same time placing West Virginia industry on a level competitive field with industries in other states.

Our last comment is regarding the half-mile rule in the Ohio River. As I noted earlier, drinking water from the mill is one of the uses for water that's withdrawn from the Ohio River by Weirton Steel. This water is treated in an on-site potable drinking water plant. The water has always met the

applicable drinking water standards and it will continue to do so.

The drinking water plant is located less than one-half mile downstream from the outlet 002 discharge on the Ohio River. The discharge from outlet 002 is almost entirely noncontact cooling water which is withdrawn from the Ohio River. As such, the discharge is basically water taken from the Ohio River, which is discharged back into the Ohio River.

As it currently exists, the one-half-mile rule would require Weirton Steel to either relocate the intake for our drinking water plant or the discharge for outlet 002 or ensure that the discharge from outlet 002 meets the water quality criteria at end of pipe.

Early studies indicate that the most cost effective engineering solution would be to relocate the drinking water intake at a cost of approximately one-million dollars. This relocation would absolutely have no beneficial impact on the water quality in the Ohio River or in the quality of the drinking water from the drinking water plant. Indeed,

if anything, the relocation would have an adverse impact on the aquatic community in the Ohio River because of the dredging and piling work that would be necessary for the new intake.

This situation is completely different from which the half-mile rule was designed to protect, i.e., a situation where an industrial discharger is unfairly placing an additional burden on another party's drinking water supply. Under these facts, it should be Weirton Steel's decision whether to treat the water to meet the drinking water standards or to discharge from the outfall. However, Weirton suggests that the most appropriate way to address this issue is to exempt a very short stretch of the Ohio River from the one-half-mile rule. This specific language for a proposal was provided to the Board earlier and is also set forth in our written comments.

Weirton Steel believes that this small amendment is appropriate for a number of reasons, including, one, we are the only entity impacted by the amendment; two, we own all the land immediately adjacent to the shoreline along this section of the

Ohio River; three, the next closest drinking water intake is several miles downstream and will not be impacted by this amendment; four, the remaining water quality regulations will ensure that the discharge from our outlet 002 is protective of human health and the environment; and, last, concerns expressed by others regarding accidental releases or spills should not be determinative of how effluent limitations are set but rather should be addressed by spill response and reporting requirements. Weirton's programs in this regard far exceed that required by state law.

For the reasons set forth above, Weirton Steel encourages the Board to retain the existing site specific standards for Harmon Creek for iron, temperature, and fluoride; and site specific standards for Harmon Creek for lead, zinc, phenols, and cyanide; replace the existing statewide aquatic and human health criteria for phenolic materials with the EPA aquatic and human health criteria for phenol; and modify section 7.2.d.15 to provide that the half-mile rule does not apply to a short section of the Ohio River.

Thank you.

MS. CHATFIELD: Thank you.

Bob McLusky.

MR. McLUSKY: I think you can hear me from here.

I'm Bob McLusky. I'm here on behalf of the West Virginia Coal Association and the West Virginia Mining and Reclamation Association.

First, both associations would like to support and applaud the Board's seeming willingness to delete the aquatic life criterion of one-point-zero milligrams per liter for manganese. And the reasons for that have been expressed before. Mr. Yaussy expressed some of them. Mr. Hylton and others have been before the Board many times on the technical bases.

There is, though, some confusion which flows from the fact that there is an addition to the existing aquatic life criterion of one milligram per liter, a public water use criterion also of one milligram per liter, and apparently some believe that there must or there is a presumption that all the

waters serve category A, public water supply use. And that presumption must be applied in all permitting decisions. And that that can only be changed through rule making.

We, the associations, will have filed comments, if they haven't been filed already, which suggest that that is not the approach required by the regulations. But the regulations create presumptions only that the waters are aquatic life uses and water contact recreation uses, which I believe are category B and C, rather than A.

But, in addition, I want to point out to the Board some practical problems with any approach that would require rule making in order to utilize any relief the Board would grant for aquatic life criterion on manganese. The problem is that rule making is the approach that must be utilized. As the Board knows, any rules to be approved by the 1998 legislative session would have to be to the rule making review committee, I believe, next month, which certainly isn't going to happen for manganese, which means there's no relief in sight until at least 1999 for any discharge

that needs a rule making order to avail itself of the relief for manganese.

In addition, the Board needs to consider that if it is going to implement this only through rule making, then it is going to be faced with dozens, if not hundreds, of rule making petitions by dischargers. I believe that's a work load the Board is not equipped to deal with adequately and in a timely fashion.

We believe that the problem can be dealt with through the permitting process. That is, DEP's job is to determine what use the streams meet in protecting the permitting process. We believe that's the approach that is required by law, the only one authorized by law. We believe that if the Board wants additional public input, it can require an annual listing by DEP of those streams in which dischargers are discharging manganese in which some members of the public believes there is a use other than aquatic life use. It can be challenged both in the permitting process and before the Board in some type of annual rule making review. It would be as protective of the

public and a lot easier to use in the long run.

MS. CHATFIELD: Thank you.

Dave Flannery.

MR. FLANNERY: Thank you. I'm Dave Flannery. I chair the environmental committee for the West Virginia Chamber of Commerce. I'm pleased to have the chance to appear before you this evening.

The Chamber, like others, will be filing its comments a little before your deadline on Wednesday and will have detailed comments on a variety of the regulations that you proposed for change and some you haven't.

I'd like to limit my comments this evening to three or four points. First let me indicate that we strongly support the review which the Board has committed to undertake to examine the total recoverable versus dissolved metals component. We think that is a critically important issue for West Virginia. Those metal standards were all adopted on a toxicity basis. We need to undertake a review of those criteria to determine the bioavailability of those metals. That, after all, is what ought to be driving the water

quality standards for this issue. And we welcome your establishing a working group to consider a review of that, presumably to determine what the merit of that will be for next year's rule making season.

We also have another metal we would like to add to that list for review. And that deals with iron. Iron, the water quality standard for iron, as you know, is not set because of bioavailability. Its basis is a completely independent criteria, to be sure, driven off EPA documents which occurred in the mid-'70s and they haven't been reviewed in an awfully long time. We have reason to believe that just as you're undertaking review of the dissolved versus total metals for other parameters, the iron number needs to be looked at as well.

We would propose for your consideration that as you think about establishing a review body to look at the recoverable versus dissolved metals, that you think about doing that as well for iron. We have discussed that issue with the Division of Environmental Protection, were told that they would be disposed to participate in such a body if the Board

were inclined to establish that. We would strongly encourage that for your review. Iron's large presence in the stream is largely there as a result of storm water runoff and it's creating some very difficult compliances. And with the developments with respect to TMDL determinations and the new initiatives that are to be undertaken there, attention to the iron water quality standard we think is critically important.

I would also address a couple of procedural points. I would start, I suppose, by commending the Board for continuing with its process of allowing open participation at really all stages of its proceeding as it deals with triennial review. Having said that, at least in the Chamber, many of our members found it particularly difficult this time around to deal with the process related to reviewing site specific water quality standards and site specific criteria.

And as it turned out, many of the issues related to those criteria were joined by letters that the Board received from EPA back in 1995, perhaps even before. And what we found was that as this

process played out, a lot of companies were being asked to do rejustifications of water quality criteria in a very short time period, in a matter of just a few weeks, even though the issues had been joined by EPA many months ago.

I don't know that we have a hard proposal to present to you about how that might be done in the future. But if the Board knows that these kinds of site specific criteria are going to come up for review from time to time, perhaps we ought to think about some kind of a process that doesn't require that to be compressed quite so readily during the rule making season.

On balance, we are very supportive of the process the Board uses. It's a very effective one and we encourage your continued openness as you deal with these critically important public policy issues.

On behalf of the Chamber, I thank you for the chance to be here this evening.

MS. CHATFIELD: Thank you.

Margaret Janes.

DR. JANES: My name is Doctor Margaret Janes

and I represent the Potomac Headwaters Resource Alliance. We're here commenting about fecal coliform standards proposed changes. We strongly support the proposed modification of the standard as indicated in 8.12.

While we agree with the West Virginia Farm Bureau that better indicators need to be found and that may indicate the source of fecal contamination, availability of funding and data would lead us to believe that fecal coliform standards are here to stay for a while. We view any delay in modifying the current standards a threat to public health.

Fecal coliforms are a useful indicator and in fact this indicator may actually underestimate some of the nastiest of organisms that are also resistant to chlorination and present a tremendous hazard to our drinking water facilities.

We strongly contest the Farm Bureau's assertion that nonhuman sources of manure do not pose a human health risk. The zoonotic capabilities of numerous organisms found in animal manures is well documented. Some of these organisms are Giardia,

cryptosporidium, E. coli, 0157, salmonella, camplobacter, staphylococcus, streptococcus, mycobacterium, and cornybacterium. These organisms challenge the capabilities of our aging drinking water plants and potentially increase the risk of water borne disease both from drinking water and recreational use.

Surface waters are a main source of drinking water for many West Virginia communities. And drinking water plants across our state use these rivers three-hundred-and-sixty-five days a year. West Virginia needs a fecal coliform standard that protects drinking water to the greatest extent possible. And this is really a major concern for us.

MS. CHATFIELD: Thank you.

Charles Merritt.

MR. MERRITT: My name is Charles H. Merritt. I am a representative of the West Virginia Environmental Council from the Highlands Region. That encompasses Tucker, Randolph, Pocahontas, and Pendleton Counties. I don't have any great technical expertise or information to give this evening. But I do have a lot of anecdotal expressions of concern, particularly

for the Potomac headwaters region of Grant and Pendleton and Hardy Counties.

I have done many, many years, over twenty years of recreational use of those waters since the mid-'70s. Seventy-six was the first year that I first boated on the Potomac headwaters, fished, swam in those waters. And over the years I certainly have seen the growth of all the agricultural-related nonpoint source problems in that watershed.

I want to give you my personal assurance, though I'm sure you're aware that it's certainly possible to pick up waterborne diseases just by recreating in this water. It might be a type B use but it's certainly possible. And these waters are high quality. They are visited by numerous, hundreds, thousands of recreational users every year, not just from West Virginia, but a fair more portion of local residents. And over the years, I've seen the build up of not only the poultry industry, which has been booming in the last five or six years, but also more cattle feed lots. And I've personally seen the piles of poultry litter, chicken carcasses, cows in streams,

all the classic examples. It's all there. And I personally have become sickened while boating in the Potomac drainage. And I know that it's possible to become sick while recreating on these waters.

I fully support and I know our environmental council supports a modification of the fecal coliform standards to make them, if not more stringent, if that's not the right word, but to maybe give a tool for agencies to have a little more backbone in enforcing clean water regs. And as I said, I want to emphasize that this drainage is in dire trouble not only from fecal coliform but over nitrification, potassium and nitrogen.

Also there is extreme flood damage. There are water quality violations of gross character, dredging, bulldozing in streams. This may be out of the purview of this water quality Board, maybe it's not-- But I do want to emphasize that from the recreational standpoint, the water quality Board should pay attention.

Thank you.

MS. CHATFIELD: Thank you.

Pam Merritt.

MS. MERRITT: My name is Pamela Moe-Merritt and I am the conservation program director for the West Virginia Rivers Coalition, which is whom I'm representing this evening. We are a nonprofit organization whose mission is the conservation and restoration of West Virginia's rivers and streams. And for those who are not familiar with us, we have forty-three affiliate groups statewide and approximately twenty-three-hundred individual members.

And before I go ahead and continue with the comments that I would like to make this evening, we have three of those groups here this evening and their representatives have spoken. That would be Cindy Rank with the West Virginia Highlands Conservancy; Doctor Janes with the Potomac Headwaters Resource Alliance; and my husband, Chuck Merritt, from the West Virginia Environmental Council. And I would just like to say that the West Virginia Rivers Coalition also stands in support of the comments that those individuals have made.

We had submitted a letter in March to

the Environmental Quality Board concerning the fecal coliform standard. And so essentially I guess what I would like to say this evening is that we are pleased and we stand in strong support of the proposed modification. And I'm not even sure that's the right word. Maybe more just saying clarification is a better choice for what you're proposing to do. And in addition to that, we would like to also support the definition that you are proposing for nonpoint source pollution.

In the work that we do, we are finding a lot, a greater transmission of disease through water contact, whether that be drinking water or water contact recreation. And the outbreaks of the diseases that Doctor Janes spoke of are on the increase. And we think it's just very important that we have a standard here in this state that does fall into the way that EPA is regulating for this standard.

One of the attachments that we have on our comments is some USGS data that does pertain to the Potomac headwaters and shows both fecal coliform and fecal strep tests that were done from March '94

through August '95. We in fact find them to be quite alarming considering what the current standards are. Some of the tests are up to two-hundred-and-twenty-thousand colonies per hundred milliliters in our current standard. And as many of you know, it's much lower than that.

We also, you know, are following reports of the impact to other organisms besides human beings. And we find that livestock are also susceptible to and sustain negative consequences to contaminated water. The studies we've reviewed show increased illness, infection, and decreased weight gain due to the exposure to contaminated water.

So we believe it's vital to adjust the standard to protect our drinking water supplies and to protect the ability for us to enjoy and be safe while recreating within our state's exceptional rivers.

Thank you.

MS. CHATFIELD: Thank you.

Those are the only folks who have signed up. But I know some people came in later. So I would like to provide an opportunity for anybody else

who wants to speak.

(WHEREUPON, a discussion was had off the record.)

MR. CHATFIELD: Anybody else who came in late and wants to sign up can do so.

(WHEREUPON, a discussion was had off the record.)

MR. BAKER: I'm Lewis Baker. I'm with the Ohio Valley Environmental Coalition.

And I was the citizen representative on the EQB's body burden committee. Our committee had also a representative from industry, and the majority of the committee was made up of agency personnel. We had a fairly frank discussion. I was not pleased with most of the outcome though.

And it seems to me-- I'll make some what I think are creative or constructive proposals for changes to the proposed rule change. But first, I would just like to mention that I think the cause of my frustration on the committee is related to the dynamic that plays out in our society at large.

There seems to be a pecking order in

our society where the people that can afford to drop a lot of money on political campaigns are at the top of the pecking order. Below them are the politicians who win those campaigns with those war chests of campaign dollars. The politicians then appoint people to run their agencies for them. And the appointees then place the pressure that comes down from the campaign contributors onto the folks that are the middle managers and below in the agencies.

If someone in an agency, a political appointee or lower, bucks the system by honestly listening to what the public has to say, they may lose their job. We've seen that with the regional administrator of EPA. Also if any agency people play by the rules, then they may get a lucrative position in the industry later on.

There has been, I know at EPA, a revolving door between industry and agency heads. So that's the dynamic. And I think that's the cause of my frustration. Because otherwise this was a committee of intelligent people with a pretty good grounding in science. And yet the committee seemed more times than

not to ignore science and simple mathematics.

Okay. Having said that, I would like to make some recommendations more specific to the rule. As I said in the committee, almost in every meeting when we had these meetings, the body burden criteria needs to be kept on the books. It works. It worked in court. It's very simple. It's a very simple thing to use. It's a numeric value just like the water quality standard.

You know, if we had-- If we abandon, say, speed limits, the numeric values on the posted speed limits, in favor of something complicated like a confusing mathematical equation, I don't know how the citizens or the police or the courts would make sense of traffic on the highways. And yet that's exactly what EPA proposed we do. They propose we throw out our fish tissue standards for those contaminants that we can't easily measure in the water but become so magnified in the fish that we can easily measure them there. And we can easily tell whether or not those contaminants in the fish are above a level that represents a real risk to humans that eat the fish.

EPA said we had to get rid of our fish standards because they were not consistent with our one-in-a-million risk of getting cancer from a contaminant that would be either in fish or in water. However, the simplest thing is just to correct those criteria to that risk level. EPA gave us the numbers, but then they didn't want to use them.

In order to make fish tissue criteria or body burden criteria most comparative to a water quantity of the same contaminant, we might need to also adjust those criteria to the lipid content of the fish. And that's not hard to do either. That's dividing one number by another. And we can have numbers like that in the rule. Again, I've proposed that over and over again and I was derided for beating a dead horse. The body burden committee seemed like it wanted to talk about everything except body burden.

EPA proposed instead that we use a complicated equation. They called it the back calculation method. It takes fish tissue values, corrects them for lipid content, and then also corrects for such things as the dissolved organic content of the

water and particulate organic content of the water. However, EPA didn't have any numbers for DOC and POC in West Virginia waters. And it fell to me to come up with the first set of numbers we had and ask them to look for more.

The equation also has to use something called a KOW. That's an octanol to water coefficient. Octanol is a solvent and things like dioxin, PCBs, contaminants we're talking about, they'll dissolve in that fairly readily and they're almost absolutely insoluble in water. The reason octanol is used is, it's kind of a substitute or a stand-in for fish limits and it's an estimate of how much of this stuff will concentrate in fish lipid instead of water. EPA didn't have any ready numbers for KOW for the committee to use. And it was only about after the third or fourth request I made, that they came up with some numbers. And those were not all correct. However, we finally came up with those numbers.

And we talked about doing a number of things. We could take the DOC and POC values that I had obtained from the USGS and derive what are typical

values for the state and include those in the rule as default values. By using those and the default values that EPA provided for the KOW fudge factor, we could derive default bioaccumulation factors. Okay. A bioaccumulation factor then is that ratio between what's in the fish lipid and what's in the water.

And so that's what I have done. I have modified the table F-2 that was proposed so that it makes use of the default DOC and POC values. It also includes, the table includes a column of default bioaccumulation factors for the state for all the contaminants we looked at.

Instead of using this complicated equation that EPA never once was able to use in the committee, although I always asked them if they could crank through the math, they never did. Instead of using that complicated equation, all you have to do is take the default DAF for a contaminant and divide that into the lipid content of any of those contaminants that you measure in fish and that will tell you what's in the water. Then you can compare that to the water quality standard if you want to. But I must tell you

the water quality standards are not consistent with the one-in-a-million risk, just like our fish tissue standards aren't. However, EPA refused to acknowledge that and said it was inappropriate for the body burden committee to look at our water quality standards.

As a matter of fact, EPA said, to have fish tissue standards and water standards in the same rule is too confusing. And that's another reason why we ought to just throw out the fish standards. But if you look at our rule, you will see that there are any number of water quality standards in it. And, you know, where do you use one instead of the other? You figure that out.

It certainly doesn't make any sense to throw out one tool that works and adopt another one that won't or the agency can't make it work. But I think maybe we could have both in the rule. We could have fish tissue standards improved beyond what we had before and we could have their back calculation method that we can simplify and make it user friendly. And we could use both of those things.

I think in section 8.5 of the

proposed, this is the section proposed to be added, we ought to have a section C there which would allow for the use of two new sampling techniques that the committee talked about where you can also measure the amounts of dioxin and PCBs and these other things in the water. One is called a high volume sampler. The other is a semipermeable membrane. And I propose that section 8.5 C would allow using these two sampling methods to detect what's coming out of an outfall.

The committee refused to apply these new techniques to end-of-pipe concentrations. And I don't understand that either. But, you know, in view of what I said early on about the pecking order in our society, it seems to make sense.

Also in the rule, section 8.5, small *a*, we mention the need to address parameters of concern. I think that ought to be bioaccumulative contaminant, or, excuse me, bioaccumulative chemicals of concern, BCCs. That might seem like a small point but the Great Lakes initiative and the State of Ohio have adopted a list of BCCs. It includes the seven or so contaminants we talked about but also some others.

They have a list of twenty-two chemicals that are highly bioaccumulative, highly toxic. They don't break down easily, so they're persistent. So we ought to use the term bioaccumulative chemicals of concern, BCC. We did have that I think in table F-2 maybe. And to be consistent we ought to have it.

In the committee I recommended we adopt all twenty-two of those chemicals and derive bioaccumulation factors for them. And the committee adopted one of the ones we didn't have, hexachlorobenzene. I think we could just as easily adopt the rest of them. And so OVEC proposes we do that.

I see no reason why we can't have any number of tools to work with. We could have a fish standard. We have a back calculation method that works. We can adopt high volume samplers and semipermeable membranes. And each of those methods, to understand what's out there in the environment, may have its place. In other words, the high volume sampler is not all that easy to set up in one place and move it to another place and then move it to another

place. You get one sample at a time. And it may take you a number of days to pull enough water to get that sample. You'd have to tear it down and move it if you wanted to get a lot of samples. Something like that might be best to set it up in one place and leave it there for an extended period of time and draw a number of successive samples in the same place. And so we could look at how these contaminants change over time in the same place and correlate that with storm events and other things that stir up the contaminants that are in the sediment.

We could also look at how DOC and POC fluctuate over time and other parameters and try to make sense of it from that perspective. And one of the best places to do that would be at an outfall. An industry could fine tune their discharge, fine tune their processes so that they could do their best to eliminate these things.

The semipermeable membranes are like artificial fish and you can-- And they're cheap and easy to use. A lot of agencies, USGS, U. S. Fish and Wildlife, many universities, and agencies around the

world have used these things.

The industry representative on the committee, I must say, was against the use of these and thought only the high volume sample could be used. But the artificial fish, you could put out a lot of those at the same time and you can cover an area from above an outfall to below an outfall. You can cover the area above and below a hot spot of highly contaminated sediments. You could put semipermeable membranes at different levels, some of them shallow in the water, some deep. Because these contaminants and the other chemical parameters associated with them are not the same. The water is not monitored. It's all dynamic. So you can learn an awful lot using those sampling methods.

The fish themselves are very important because that's what people eat. These other things estimate what people might eat using complicated equations and fudge factors. But the fish themselves are what people are going to eat. And the fish also give us some very good numbers. A fish accumulates these contaminants over an extended period of time. So

each fish, therefore, has a composite sample in its body. Typically when fish tissues are collected, any number, maybe, say, five different fish are composited into one sample. So you have a composite when you run a fish analysis. And once you correct your lipid content, you see a consistent number even between species.

So fish are very good because it tells what people might eat and are also scientifically valid sample points. Fish do migrate, so they won't tell you very much what's coming out of an outfall. It won't tell you very much about a contaminated hot spot. And so they're good for background concentrations but not for the other things. The back calculation method could be used. But it needs to be very much simplified. So--

I may have some other comments that are not in the written comments I submitted and I can supply those to you in the next day or two.

Thank you.

MS. CHATFIELD: Thank you.

We've got one more on the list.

Mary Wildfire.

MS. WILDFIRE: My name is Mary Wildfire. I'm from the Concerned Citizens Coalition of Roane and Calhoun County. And I want to talk about fish tissue sampling.

I think that there are important technical problems with fish tissue sampling. The thing is, some of these problems we may be able to iron out in the next few years when it becomes possible to create computer-generated virtual fish which would be much more manipulatable in various useful ways. But as of now we have to catch actual fish from real rivers and the goddamn things are full of dioxin and other toxins. This creates problems with permitting.

So I suggest that we stop catching fish, which are then dead, that's not a moral problem because they're only fish, but dead fish stink, they have that real world stink about them, and withdraw to air conditioned rooms where we can draw the curtains, hang beautiful pictures of nature on the wall, and use computers and fancy math and acronyms, to draw lines, semantic lines. We can pretend there's only one

facility and we can talk only about the air or we can talk only about the water. And we can get rid of problems like dioxin that way.

Therefore, I think there are important technical problems with fish tissue sampling. And we probably had best withdraw it.

Thank you.

MS. CHATFIELD: Thank you.

Is there anyone else that wants to comment on the water quality standards?

(Pause.)

MS. CHATFIELD: Anybody come in late that didn't get on the list?

(Pause.)

MS. CHATFIELD: Going.

(Pause.)

MS. CHATFIELD: Going.

(Pause.)

MS. CHATFIELD: Gone.

We will now move to the groundwater standards. We had no one that signed up specifically to talk about them. But if there is anybody that wants

to make comments on the proposed changes to the groundwater standards, you may do so now.

(Pause.)

MS. CHATFIELD: All right. If we have no more comments on either rule, do you have any comments you would like to make, Doctor Tarter?

DR. TARTER: I'm glad you're here. We appreciate your coming. We appreciate your input. We're going to go to work and do some reading.

MS. CHATFIELD: As I said before, the deadline for written comments will be Wednesday. We'll take fax copies or whatever you can get us.

We will-- The Board will convene at three o'clock on Thursday in this room, I believe, yes, in this room, and then we will work for as long as we need to on the rules.

And then at seven o'clock on Thursday, the Board will convene for a hearing on the application for a remining variance for Uphold Trucking.

Yes.

A VOICE: Just a quick procedural question,

Libby. Is Thursday's meeting open on water quality standards?

MS. CHATFIELD: Yes, it is. Yes, it is.

A VOICE: Thank you.

MS. CHATFIELD: Thank you very much for coming.

REPORTER'S CERTIFICATE

I, the undersigned, Janet T. Surface, Stenomask Reporter, do hereby certify that the foregoing is, to the best of my skill and ability, a true and accurate transcript of the proceedings had in the above-styled matters on the 21st day of July, 1997.

Given under my hand this the 26th day of August, 1997.

Janet T Surface

Reporter

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ENVIRONMENT & HEALTH

July 23, 1997

West Virginia Secretary of State
Administrative Law Division
1615 Washington Street East
Charleston, WV 25311

Re: Comments on Environmental Quality Board Proposed Amendments to Water Quality Standards Rule (46 CSR 1)

Dear Sirs:

American Forest & Paper Association, Inc. (AF&PA) submits the following comments on proposed section 8.3 and Appendix F to the Water Quality Standards rule, which would establish new procedures for determining background concentrations of nine chemicals with numerical water quality criteria lower than their detection limit. AF&PA is the national trade association of the forest, pulp, paper, paperboard and wood products industry. AF&PA represents approximately 400 member companies and related trade associations which grow, harvest and process wood and wood fiber; manufacture pulp, paper and paperboard products from both virgin and recovered fiber; and produce solid wood products. AF&PA has a number of members in West Virginia that would be affected by the proposed rule.

AF&PA believes that the Environmental Quality Board should defer adopting any new rule designed to assess indirectly background concentrations of pollutants below the already extremely low detection methods for the nine chemicals of interest. The Board is not legally obligated to adopt these rules, and the scientific basis for the proposed three protocols is inadequate and has not been subject to sufficient public and peer review. All three of the approaches have some significant flaws, but the problems are particularly acute with respect to back-calculation from fish tissue concentrations and use of semi-permeable membrane devices.

Need for the Proposed Procedure

It appears to AF&PA that the Board is, perhaps at EPA Region III's urging, going beyond typical approaches for load allocations, and in so doing the Board is attempting to provide a procedure where one cannot yet be scientifically justified. AF&PA is aware of nothing in the EPA water quality standards regulations at 40 C.F.R. Parts 130 and 131, the NPDES permitting regulations at 40 C.F.R. Part 122, the EPA Water Quality Standards Handbook or the Technical Support Document for Water Quality-Based Toxics Control that require states to postulate background concentrations of chemicals that cannot be measured, either for purposes of assessing water quality or for purposes of determining waste load allocations. In fact, AF&PA believes that in most states this issue is dealt with either by assuming that the background concentration is zero or is a function of known contributions of the pollutant from point sources (for pollutants such as dioxin or PCBs) or through the use of margins of safety in establishing TMDLs.

Of the nine chemicals for which the "protocol approach" is proposed, two-thirds or more are banned pesticides or other chemicals unlikely to be discharged by any point sources, so the protocols would have little practical application in terms of pollution control. Absent a compelling need, West Virginia should not be "pushing the envelope" to impose procedures that are not legally required, are not typically applied in other states, and do not have an adequate scientific basis.

Back-Calculation Method

The proposed protocol for attempting to back-calculate ambient water column concentrations from fish tissue concentration data is inherently inaccurate and would be extremely costly and time-consuming. BAF back-calculation is not even used in the Great Lakes Water Quality Guidance (GLI) from which West Virginia proposes to obtain the BAFs. This technique was considered and rejected early on by the EPA Technical Workgroup which formulated the GLI. They concluded that any water concentration obtained from such a calculation would be too unreliable for regulatory purposes.

Moreover, when considering what would be involved in the back-calculation method, it is clear that it would be a very costly and time-consuming process. Even if the GLI default BAFs were used (which we explain below would be completely inappropriate), obtaining and analyzing the appropriate number of fish

species and from the appropriate locations to ensure determination of a representative fish body burden would surely be a very time consuming, labor intensive, and costly enterprise. If a site-specific BAF is used instead of the GLI default, as we argue below is necessary, then the back-calculation would entail even more effort, since the derivation of the site-specific BAF requires extensive fieldwork itself.

The GLI BAFs are not appropriate for use in most waters of West Virginia and site-specific BAFs are not a practical alternative for use in the back-calculation method. All the default GLI BAFs proposed for use in the back-calculation method are based on large lake foodchains. Even those calculated from a laboratory BCF use a foodchain multiplier derived from a model calibrated to a large lake foodchain. The amount of bioaccumulation that occurs through the foodchain depends on a large number of factors, among which are species, number of trophic levels in the foodchain, trophic state of the water body, and temperature. The GLI baseline BAFs are all meant to reflect the conditions in a large lake such as Lake Superior. In terms of the relevant factors, there are few, if any, water bodies in West Virginia that resemble such lakes. The GLI itself recognizes the inappropriateness of applying those defaults even to other water bodies in the Great Lakes basin, by making available mechanisms for determining site-specific BAFs. See, e.g., 40 C.F.R. pt. 132, Appendix F, Procedure 1.

The proposal also indicates that site-specific BAFs could be used in the back-calculation method. However, unless such a BAF has already been determined, it would make no sense to determine one solely for the purpose of doing the back-calculation. The most reliable site-specific BAF would be based on direct measurement of the chemical concentration in water at the site. Of course, if this were possible, back-calculation would not be necessary. Indirect methods of determining the water concentration (e.g. modeling), are not only costly and difficult to do, but they introduce additional uncertainty. It is inconceivable that determination of a site-specific BAF for use in the questionable back-calculation method would be either cheaper or more reliable than simply making direct measurements of the water concentration using high volume sampling.

Semi-Permeable Membrane Devices

AF&PA was surprised to see the proposed use of semi-permeable membrane devices, or "fat bags" to quantify background *water* concentrations. While we are aware of research being done on these devices, we are unaware of a reliable,

generally applicable method for back-calculating from the bag concentration to the water column concentration. This would require knowledge of the concentration factor for the bag. Unfortunately, a number of factors can influence this, including flow regime, temperature, membrane type and thickness, membrane fouling, and type of absorbent in the bag. In essence, every bag in every location would have to be calibrated. This would be difficult in the extreme.

Specifically, the determination of accurate water column concentrations using SPMDs requires:

- The development of compound-specific calibration factors for every chemical targeted for analysis.
- The development of a quantification algorithm capable of correcting for site-specific bias resulting from the effects of "biofouling" and temperature on SPMD uptake.

Although calibration factor data exist for some specific PAH and organochlorine pesticides, including DDT, dieldrin, endrin, and hexachlorobenzene [Huckins et al. 1996. Semipermeable Membrane Devices (SPMD) for the Concentration and Assessment of Bioavailable Organic Contaminants in Aquatic Environments. In G.K. Ostrander, ed., *Techniques in Aquatic Toxicology*. CRC/Lewis Publishers, Boca Raton, FL, USA, Chapt. 34], a means of correcting for the bias imparted to SPMD measurements resulting from site-specific variability in "biofouling" and temperature has not yet been developed. Until both these data gaps are filled for the analytes of interest, SPMD measurements are subject to unknown bias and are thus inappropriate for compliance monitoring. Brief discussions clarifying the technical basis for these two points are presented below.

1. <u>For quantitative analysis, a compound-specific calibration factor is absolutely necessary</u>.

With any quantitative analytical methodology, a calibration factor is necessary in order to relate a measured signal to sample concentration. As discussed by Huckins (Huckins et al. 1996), the mass of chemical recovered from an SPMD can be related to (dissolved) ambient water column concentrations using one of two calibration functions, depending on whether or not the partitioning of the specific chemical of interest has reached equilibrium.

When data show that an SPMD has reached chemical-specific equilibrium with the water column, the dissolved water column concentration can be calculated using a partition coefficient, i.e., under these conditions, the calibration factor would be the chemical-specific SPMD/water column partition coefficient (which is unitless). Alternatively, theory predicts that there is an initial period of time over which uptake of a chemical by an SPMD follows a first order relationship, i.e., the mass of chemical recovered from an SPMD will be a linear function of time. Thus, the dissolved water column concentration can be calculated from the mass of chemical recovered from an SPMD using an experimentally determined, chemical-specific first order rate constant, and this rate constant is the correct calibration factor under these conditions. Huckins has termed this first order rate constant the effective sampling rate (Rs), and these calibration factors are expressed as L/day.

The period of time over which SPMD uptake is a linear function of time is dependent on both the chemical-specific SPMD/water partition coefficient and the chemical-specific sampling rate. If both these parameters are known, the correct calibration factor (partition coefficient or Rs) for a specific deployment period can be assessed based on first order kinetic theory. Otherwise, an SPMD deployment must include replicates over time to characterize chemical-specific uptake for the purpose of demonstrating that the correct calibration factor is being used, i.e., that concentrations are not calculated using Rs when the SPMD is in fact at equilibrium (a calculation which would under predict water column concentration).

Petty et al. [1994 National Biological Survey Tech. Rep. "Laboratory Studies of the Use of Semipermeable Membrane Devices (SPMDs) as Passive Water Samplers of Polyaromatic Hydrocarbon (PAH) Priority Pollutants", Midwest Science Center, Columbia, MO.] have developed sampling rate calibration factors (Rs) for the priority pollutant PAH, and these range from a low of $\approx$ 0.2 L/day for naphthalene to 7.5 L/day for pyrene. These workers have also reported chemical-specific Rs values for some chlorinated pesticides, which range from 0.2 L/day for beta-BHC to 8.2 L/day for hexachlorobenzene (Huckins et al. 1996). The sampling rate for 2,2',5,5'-tetrachlorobiphenyl has been reported as 5 L/day [Lebo et al. 1995. Use of the Semipermeable Membrane Device as an *in Situ* Sampler of Waterborne Bioavailable PCDD and PCDF Residues at Sub-Parts-per Quadrillion Concentrations. *Environ. Toxicol. Chem.* 29(11): 2886-2892]. Overall, these experimentally determined sampling rates span an approximate factor of 40 (8.2/0.2).

An additional concern is that there is no certainty that a calibration factor determined by exposing the fat bags to detectable concentrations of a contaminant would be the same as the calibration factor when the fat bag is exposed to far lower nondetectable concentrations of the contaminant. The calibration factor may not be constant over a range of contaminant concentrations, and in fact the relationship may not even be linear.

Because the experimental determination of Rs values is logistically demanding, there is value in developing models for predicting Rs values from chemical-specific, physicochemical parameters such as pK_{ow}, and efforts in this area have shown some empirical relationships between Rs and pK_{ow} (and pK_{lw}, or lipid-water partition coefficient). However, depending on the chemical and the deployment period, up to 50% of the mass recovered from a whole SPMD can be associated with the membrane (Huckins et al. 1996). Since most SPMD analyses do not involve separating the SPMD lipid (triolein) from the membrane, the correct parameter for modeling is the (whole) SPMD/water partition coefficient, which would need to be determined experimentally, i.e., would require the determination of the compound-specific calibration factor for an equilibrium-based concentration measurement.

Although empirical relationships between various molecular indices and Rs have been observed, the accurate prediction of chemical-specific Rs values is not yet possible. This is reflected in the acknowledgment that even "in the case of isomers and homologs with about the same molecular dimensions, bond rotational freedom, molecular flexibility or conformational freedom, and shape do affect SPMD Rs values" (Huckins et al. 1996). Because of these complexities, it is inappropriate to transfer Rs values from one compound to another, and calculation of a water column concentration based on SPMD response during the linear-phase of uptake requires a compound-specific Rs.

Regardless of whether quantification is attempted using the kintetics-based or equilibrium-based response of an SPMD, a compound-specific calibration factor is absolutely necessary in order to obtain an accurate measure of water column concentration.

2. <u>For quantitative analysis in an uncontrolled ambient environment, the effects of temperature and biofouling must be accounted for in order to provide accurate measurements of ambient water column concentrations.</u>

There are a number of site-specific mechanisms capable of imparting bias to SPMD recoveries (ng/SPMD). These include the effects of "biofouling" and temperature on uptake rate (Rs), as well as background/sampling contamination (often associated with atmospheric uptake during deployment) and analytical variability excluding background contamination. Although Huckins et al. have historically disregarded boundary layer effects (i.e., diffusion layers) when modeling SPMD uptake, an approximate 6% net increase in total (PCB) mass sequestered by an SPMD has also been attributed to stirring by the same workers [Huckins et al. 1993. Lipid-Containing Semipermeable Membrane Devices for Monitoring Organic Contaminants in Water. *Environ. Sci. Technol.* 27(12): 2489-2496]. Diffusion layers are important as they control the effects of mixing on uptake and, thus, determine whether or not differences in flow regime manifest as bias.

There is little quantitative data in the literature addressing the impact of biofouling on uptake rates (i.e., Rs), the single value reflecting an approximate 25 to 40% reduction in phenanthrene uptake due to this phenomenon (Huckins et al. 1996). The effects of temperature on uptake have been more thoroughly characterized, and Huckins et al. have reported that for organochlorine pesticides, Rs values increase by factors of 1.3 to 1.8 for each 5°C increase in water temperature (Huckins et al. 1996). For the priority pollutant PAH, which are characterized as "rigid planar" molecules, only "small compound-specific changes in SPMD Rs values were observed" under the same experimental conditions (Huckins et al. 1996). It has been suggested that temperature will have a greater effect on the sampling rates of molecules which have greater ability to rotate and/or vibrate, i.e., flexibility. For these molecules, an increase in temperature will increase vibrational and rotational motion (i.e, kinetic energy), effecting a greater diffusivity in the SPMD membrane (which also becomes more permeable with increasing temperature) to give an overall increase in Rs. Note that the effect of conformational "flexibility" on Rs is considerably more complex than that of pK_{OW} or molecular "size", and the observed impact of temperature on Rs is another factor suggesting that the transfer of Rs values from one compound to another is inappropriate.

Clearly, the effects of both biofouling and temperature on Rs can effect bias in SPMD measurements. The use of permeability reference standards has been cited by SPMD workers (Huckins et al. 1996) as a promising approach to correct for these effects. Regardless of the exact approach, SPMDs should not be applied for the determination of ambient water column concentrations until some means of correcting for these site-specific sources of bias has been developed.

Overall, the determination of accurate dissolved water column concentrations using SPMDs requires:

- A compound-specific calibration factor: an SPMD/water partition coefficient if the measurement is made after the SPMD reaches equilibrium with the sample, or Rs (L/day) if the SPMD is still in the linear-phase of uptake at the time of analysis.

- Deployment-specific assessment of whether the compound-specific uptake by an SPMD at the time of analysis reflects equilibrium or linear uptake.

- Some means of correcting for site-specific bias resulting from the effects of biofouling and temperature on SPMD uptake rates.

The provision in 8.3(c)B(ii) that use of the method should only be done in consultation with USEPA Region III seems to indicate recognition of the problems inherent in use of semi-permeable membrane devices for the purpose proposed. We believe that, rather than retain the method in the rule with that kind of restrictive language, which will heavily discourage its use anyway, the method should just be removed from the rule until it can be shown to be feasible.

Direct Measurement (High-Volume Sampler)

High-volume sampling is still an emerging technology that has not been fully developed, is not an approved EPA method, and is not widely used. Research utilizing high-volume sampling apparatuses is currently limited, and the method is yet to be validated at a level consistent with its proposed use as a mainstream monitoring tool. Preliminary research has focused on reagent-grade water, river water, and samples from a POTW [Biberhofer, J. and Gorrie, J.F.. 1996. The Evaluation and Application of a Large Volume In-Situ Resin Sampler for Monitoring Trace Organics in Ambient Water. 18th Annual EPA Conference on Analysis of Pollutants in the Environment. Norfolk, Virginia. May 1995, 219-318.] [Rushnick, D. 1997. Determination of CDD's and CDF's at Part-per-quintillion Levels Using a Cubic Meter Sample. Presented at the 19th Annual EPA Conference on Analysis of Pollutants in the Environment. Norfolk, Virginia. May 1996, 219-318]. Several factors would need to be considered and validation research conducted prior to the widespread use of high volume samplers. This research should specifically address the following issues:

1. Development of sampling protocols that address the issues of accurately characterizing the concentration in the water body sampled.

2. Development and validation of quality control criteria for the analytical approach that would specifically address:

   a. effective blank testing;

   b. carryover of contaminants;

   c. assessments of accuracy and precision; and

   d. the efficacy of the determinative analytical methods clean-ups when large amounts of coextractives are present.

1. Sampling Protocols

Research indicates that collection of the large volume of sample can require from two to six days (Rushnick 1997). The practicality and safety aspects of operating a mid-channel sampling apparatus need to be taken into consideration. Moving the sampling device closer to shore may not give a representative sampling. Clear guidance on the sampling regime and appropriate deployment of high-volume samplers needs to be developed. In order to accurately characterize the water column, several samples may be required to assess different seasonal conditions, various water depths, and different locations across the sampling area. This would greatly increase the financial burden of using this already expensive sampling device (~$10,000.00 per apparatus). Without an extensive sampling protocol, the analytical concentrations determined can only provide an estimate of the actual concentrations.

2. Development and Validation of Quality Control Criteria

The resins (e.g., Amberlite XAD-2 for trace organics) employed in the high-volume samplers are known to contain interfering compounds and require extensive cleaning prior to employment to collect water samples [Ethier, A.G., Taylor, S., and Taylor, B.Sc.. 1993. Intercomparison of *In-Situ* Solid Phase Extraction (SPE) and Liquid-Liquid Extraction (LLE) Techniques of the Determination of Trace Organic Contaminants in Fresh Water. Axys Environmental Systems Ltd., Sidney, British Columbia, Canada]. Protocols to effectively address the preparation of method blanks that would process the same volume of water at the flow rate of the actual

samples and would utilize the same number of filters and resin columns should be developed and validated prior to the use of this technique. This would require that reagent water absent of the target analytes could be produced. It should be noted that research conducted by Dale Rushneck indicates that ultra pure reagent water prepared for use with high-volume sampling projects was found to contain octachlorodibenxo-p-diozin (OCDD) (Rushnick 1997). In addition, it should be noted that XAD resins are commonly used as absorbents in air testing methods and at lower detection levels, airborne contamination may substantially impact the results obtained using the high-volume samplers. Therefore, field blanks would need to be collected to verify that the sample collection system remains clean during the transportation of the resin columns and filters to the field and the return of the resin columns and filters back to the laboratory for extraction and analysis.

These devices can be adversely affected by fluctuations in the levels of suspended solids in the water, which can slow extraction rates and require more frequent filter changes or the use of multiple resin columns (Rushnick 1997). The need to frequently change the filters could increase the potential for system contamination. The resins have a limited capacity for organics, and although the target analytes are likely to be at concentrations that would not approach the column capacity, the presence of high, non-target organics may exceed the capacity of the column, resulting in breakthrough of the target analytes. Under these conditions, quality control procedures would need to be established and validated to address problems of breakthrough and contamination of the sample collection system.

Due to the costs of the high-volume sampling apparatus, it is very likely that the same apparatus will be utilized to collect several samples. Verification of the effectiveness of between-sample cleaning of the equipment would be needed to eliminate the possibility of cross-contamination of samples via the sample collection device.

Method accuracy is usually assessed by determining the recovery of surrogates or matrix spikes of the target analytes using an analytical procedure identical to the one used to collect and analyze the samples. This can be a difficult procedure to implement in the *in-situ* sampling environment proposed. The ability to administer an accurate spike at these extremely low levels of detection, as well as difficulties associated with spiking the sample collection apparatus in a manner that will guarantee that the water environment is not affected, further complicate the process. Therefore assessment of the sampling procedure's accuracy is limited. It is also critical to

determine the precision and reproducibility of methods used for monitoring, with respect to the use of a single apparatus and the use of multiple different apparatuses.

The analytical method that will be utilized to determine that concentration of the target analytes from the extracts prepared from the high-volume samples can be impacted by the large amount of coextractives that are present. Therefore the efficacy of the determinative methods' clean-up steps will need to be reassessed.

Use of high-volume sampling does have some advantages over the other two, indirect measurement methodologies. Direct measurement of the parameter of interest avoids numerous complications and assumptions that are necessary when converting an indirect measurement back into the measurement desired. Any attempt to make measurements at the low levels anticipated by the rules is fraught with peril, but if it must be done, it should be done with the fewest complications possible. Imposing in the sampling train a transport process, such as permeation of a membrane of a "fat bag" or uptake by a living organism with subsequent biological processing, obscures the connection between the original water concentration and what is measured in the "fat bag" or the fish. Any attempt to back-calculate to the water concentration will, because the mathematical "model" of the transport process can only be an approximation, introduce error. Such error is absent in direct measurements.

As noted above,though, other significant errors may be introduced by the use of the particular direct measurement approach proposed here, high-volume sampling. Thus, until high-volume sampling is a more proven and widely-understood technique, it should not be the basis for determinations that could play a critical role in the permitting process.

Conclusion

As explained at the outset, AF&PA believes strongly that the Board should not adopt any of the proposed methodologies for estimating background concentrations. There is no legal or practical necessity to do so, and each of the protocols has important shortcomings, both in scientific defensibility and in the practicalities of implementation.

Sincerely,

Jerry Schwartz/RKS

Jerry Schwartz
Director, Water Quality Programs