DEP drops plan to finalize stream list

By Ken Ward Jr.
kward@wvgazette.com

State regulators have dropped their plan to finalize a list of protected West Virginia streams, saying they don't want to pick a fight with lawmakers over the issue.

Earlier this year, the Legislature declined to act on the list of more than 300 streams the state Department of Environmental Protection said deserved tougher pollution protections.

DEP Secretary Stephanie Timmermeyer said she planned to finalize the list anyway. Timmermeyer said the DEP had the legal authority to do so.

On Friday, Deputy DEP Secretary Randy Huffman said the agency now plans to start all over.

A new list will be published in draft form. The DEP will accept public comments and then finalize the list. The resulting version will be submitted for legislative review during the 2008 session.

"It was maybe a subversion of the legislative process for us to just go out and file the rule," Huffman said. "It's a legislative process whether you agree or not."

The list in question covers streams that are deemed to qualify for "Tier 2.5" protection under West Virginia's water quality anti-degradation policy.

Under that policy, clean streams are generally supposed to be kept that way. Streams on the Tier 2.5 list could not be degraded by more than 10 percent.

DEP officials had already whittled down the Tier 2.5 list and allowed three separate rounds of public comments. But lawmakers, at the urging of coal companies, timber operators and the Farm Bureau, were slashing dozens of streams from the list.

Originally, the DEP proposed Tier 2.5 protection for about 300 streams, about 4 percent of the waterways in the state, agency officials said.

Don Garvin, lobbyist for the West Virginia Environmental Council, said the DEP's action would help regulated industries gut the stream list.

"It's going to be almost impossible to protect streams in this state," Garvin said.

Huffman said he doesn't believe the DEP ever made a definite decision to move forward without legislative action on the stream list.

"My understanding was that was an option that was on the table at the time," said Huffman, who is running the DEP while Timmermeyer is on maternity leave. "There were a number of options there."

In a March 15 interview, Timmermeyer and DEP spokeswoman Jessica Greathouse said the agency planned to file the final rules, despite legislative inaction.

Timmermeyer cited several state Supreme Court decisions she said supported the DEP's plan.

Under those rulings, she said, lawmakers can approve, reject or amend state agency rules, but she said the Legislature can't veto an agency rule by simply not acting on it at all.

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

WEST VIRGINIA
SECRETARY OF STATE
BETTY IRELAND
ADMINISTRATIVE LAW DIVISION

Form #3

Do Not Mark In This Box

FILED

2008 JUL 28 P 2:08

OFFICE WEST VIRGINIA
SECRETARY OF STATE

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

AGENCY: WV Department of Environmental Protection, DWWM Water Resources TITLE NUMBER: 47

CITE AUTHORITY: W. Va. Code § 22-11-4(a)(16); § 22-11-7b

AMENDMENT TO AN EXISTING RULE: YES X NO ____

IF YES, SERIES NUMBER OF RULE BEING AMENDED: 2

TITLE OF RULE BEING AMENDED: Requirements Governing Water Quality Standards

IF NO, SERIES NUMBER OF 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.

Stephanie D. Timmermeyer
Authorized Signature

QUESTIONNAIRE

(Please include a copy of this form with each filing of your rule: Notice of Public Hearing or Comment Period; Proposed Rule, and if needed, Emergency and Modified Rule.)

DATE: July 28, 2006

TO: LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

FROM:(*Agency Name, Address & Phone No.*) West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304 (304) 926-0495

LEGISLATIVE RULE TITLE: "Requirements Governing Water Quality Standards"

1. Authorizing statute(s) citation §22-11-4(a)(16); §22-11-7b

2. a. Date filed in State Register with Notice of Hearing or Public Comment Period:

   6/2/2006

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

   Published as a Class I legal advertisement in the Charleston Gazette and the Charleston Daily Mail
   Distribution to e-mail mailing list of approximately 1, 000 people
   Notice placed on WVDEP's Water Quality Standards website

   c. Date of Public Hearing(s) ***or*** Public Comment Period ended:

   Public Hearing: 07/17/2006 Public Comment Period Ended: 07/17/2006

   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)

July 28, 2006

f. **Name, title, address and phone/fax/e-mail numbers** of agency person(s) to receive all *written correspondence* regarding this rule: (Please type)

Scott G. Mandirola, Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

g. **IF DIFFERENT FROM ITEM 'f'**, please give **Name, title, address and phone number(s)** of agency person(s) who wrote and/or has responsibility for the contents of this rule: (Please type)

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 or comment period:

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

DEPARTMENT OF ENVIRONMENTAL PROTECTION

BRIEFING DOCUMENT

Rule Title:

"Requirements Governing Water Quality Standards," 47CSR2

A. AUTHORITY:

W.Va. Code §22-11-4(a)(16); 22-11-7b

B. SUMMARY OF RULE:

This rule establishes requirements governing surface water quality standards for the waters of the State and establishes standards of purity and quality consistent with public health and the enjoyment thereof, the protection of animal, aquatic and plant life and the expansion of employment opportunities, agricultural expansion and a foundation for healthy industrial development.

C. STATEMENT OF CIRCUMSTANCES WHICH REQUIRE RULE:

DEP is proposing several changes to the rule, as follows:

Several clerical corrections and updates have been made. These include the replacing of "streams or stream segments" with "waters" in the definition of "Trout waters". This is to assure that lakes are not excluded from the definition. In numerous places throughout the rule the term "water body" is replaced with "water" or "waters" in an effort to be more consistent with use of the term "waters" in 47-2-1 General Scope section of the rule. Two exceptions listed in subsection 7.2.d were removed because they had expired. Stony River, section 7.2.d.6.1, expired December 31, 1998 and Simmons Creek, section 7.2.d.20.3, expired May 30, 1998. In section 8.4, a correction was made to reference the appropriate paragraphs, "6.1.b.1 through 6.1.b.6". References to "Board" or "rule making authority" have been changed to "Secretary" to reflect current authority. In section 7.2.d.9, the Blackwater River is referred to as a trout stream, which is repetitive since it is listed on the trout list in Appendix A. Therefore, section 7.2.d.9 has been amended.

Section 7.2.d.14. The Categories A and E exclusions on the tributaries of the Youghiogheny River in West Virginia which flow into Maryland have been deleted. A documentation search was done and no justification was found for this exclusion; therefore, it is being removed.

The term "not to exceed" in Table 1 of Appendix E, is being removed from numerous places where it conflicts with aquatic life footnotes 1 and 2. The phrase "Concentration not to be exceeded unless otherwise noted" is being added to footnotes 3 and 4 to assure that the intent of the human health criteria is not changed. Also in Appendix E in section 8.13, the term "Primary

Contact Recreation" is being replaced with "Water Contact Recreation" to be consistent with Category C designation as outlined in section 6.4 of the rule.

Nutrients criteria, including phosphorous and chlorophyll-a, for both warm and cool water lakes, have been added to the rule based on a consensus reached by the Nutrients Criteria Committee. A definition of "Cool water lakes" is being added to 47-2-2 Definitions. Section 8.3 has been added to the rule and states the criteria for both warm and cool water lakes with summer residence times greater than 14 days. It was also suggested by the Nutrients Criteria Committee that a representative list of cool water lakes be included in the rule. This representative list consists of lakes on the Appendix A list of trout waters and lakes which DNR is managing as cool water fisheries, again with summer residence times greater than 14 days. The representative list has been added to the rule as Appendix F.

EPA's approval of the aluminum language in 46CSR1 has allowed DEP to begin assessing warmwater streams using the 750 µg/l criteria (e.g. 2006 draft Section 303(d) List.) New permits with discharges into warmwater streams are also being issued with limits protective of the 750 µg/l value. Currently the criterion in warmwater is not to exceed 750 µg/l dissolved aluminum as both a chronic and acute value. For trout waters, the criterion is not to exceed 87 µg/l dissolved aluminum – as a chronic value and 750 µg/l dissolved aluminum – as an acute value.

Pursuant to the recent EPA finding that 750 µg/l dissolved aluminum is protective of warmwater aquatic life, DEP proposes to remove the language from 47CSR2 which effectively only suspends the warmwater chronic aluminum value of 87 µg/l until July 4, 2007. This action is in large part based on the EPA finding "[t]he criteria are protective of the aquatic life regardless of whether they apply temporarily or permanently." Essentially EPA has determined that the revised criterion is protective of West Virginia warmwater aquatic life. Since this is the case, Appendix E footnote "[e]" is being removed and the dissolved aluminum for warmwater chronic criterion of $87xCF^5$ is being replaced with $750xCF^5$ in Appendix E, Table 1, section 8.1.

The fluoride standard for Category D was changed to Category D1 to better reflect the Environmental Quality Board's intentions as per the 1986 Rationale for revisions to the rule which states "The one comment received, pointed out that criteria for irrigation water has been established at 2.0 mg/l. The Board found this to be correct and agreed to add the additional criteria for the D1 Category use."

The rule also extends the exceptions for Harmon Creek from July 1, 2007 to July 1, 2008 to allow Weirton Steel Corporation (now Mittal Corporation) to complete the requested biological assessment of the stream as well as submit additional information. Additional information has been requested in reference to updated socio-economic information and a biological assessment of the aquatic life, particularly the fish population, to assure the temperature variance will not impair an existing use. For this study to be valid it should be conducted during a period of stress, which for temperature would occur during the summer months (July or August). Extending the date to 2008 would allow this information to be gathered and keep the current limits in place until such a time that this data is available.

The formulas in Appendix E for cadmium, copper, nickel, silver, and zinc, which are used to calculate aquatic life limits, are being updated to reflect those recommended by EPA in 2002.

Finally, the trout water list (in Appendix A of the rule) has been edited to reflect the currently known trout waters of the State, as per the definition of "trout waters" in section 2.18 of 47CSR2. This list is intended to be a representative list and is not meant to exclude any waters that meet the definition of "trout waters." "Trout waters" are defined as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations."

The list was prepared with the assistance of the West Virginia Division of Natural Resources (DNR), Coldwater Management Section, the State agency with recognized expertise on this subject. The list generally is composed of streams documented as having natural trout reproduction and streams that sustain trout year round, but do not have documented natural reproduction.

The DNR submitted a list of waters as defined in Section 2.18 of 47CSR2 to DEP. This list consisted of streams supporting reproducing populations of rainbow, brown and native brook trout. Additionally, the list contained streams stocked with fingerling trout, primarily browns, that sustain year-round trout populations. The list does not include streams that are stocked with trout solely on a "put and take" basis, but do not support year-round trout populations.

The DNR considers reproducing rainbow, brown, and native brook trout populations as year-round residents because of their lifecycle. Natural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys. However, some streams, particularly native brook trout streams, are considered naturally reproducing if only adults or young-of-the-year are collected in the sample. This is based on knowledge of the stream and its location, and stocking practices in the area.

Fingerling brown trout are stocked into streams that are known or expected to support trout year-round because of the presence of suitable habitat and temperature. After a stream has been stocked with fingerlings for several years, an effort is made to conduct fish population surveys to determine if the stockings are successful in maintaining a year-round population. Again, if multiple year classes are found during sampling, or if reproduction is occurring, but is not at a level to sustain a viable fishery, then the fingerling stockings are continued. In some cases, a stream is considered capable of sustaining a year-round trout population if only one year-class is collected during sampling, prior to that year's scheduled fingerling stocking. A stream may also be considered capable of sustaining a year-round trout population if one year-class is collected during the critical low water, high temperature months of July, August, or September.

Additionally, sections 4.1.a and 6.1.b of 47CSR2 require the protection of existing uses. "Existing uses" are "those uses actually attained in a water body on or after November 28, 1975." The list therefore includes waters where sustained year-round trout populations, or trout reproduction, has been documented since November 28, 1975, regardless of their current condition.

Six (6) waters that were previously listed have been omitted from the current trout list because they were originally listed in error, and do not meet the definition of a "trout waters." There were 337 trout waters added to the list in the current rule because they meet the definition of "trout waters" as described above.

D. FEDERAL COUNTERPART REGULATIONS - INCORPORATION BY REFERENCE/DETERMINATION OF STRINGENCY:

Although the State is required by the federal Clean Water Act to adopt water quality standards, there is no direct federal counterpart regulation. Therefore, no determination of stringency is required.

E. CONSTITUTIONAL TAKINGS DETERMINATION:

In accordance with §22-1A-1 and 3(c), the Secretary has determined that this rule will not result in taking of private property within the meaning of the Constitutions of West Virginia and the United States of America.

F. CONSULTATION WITH THE ENVIRONMENTAL PROTECTION ADVISORY COUNCIL:

At its meeting on May 31, 2006, the Environmental Protection Advisory Council discussed this rule. (See attached minutes for Council's discussion.)

West Virginia Department of Environmental Protection

ADVISORY COUNCIL MEETING MINUTES

Wednesday - May 31, 2006
1:00 p.m. – 3:00 p.m.
601 57th Street, SE, Charleston, WV
West Virginia Room – 3rd Floor

ATTENDEES:

Advisory Council Members:
Larry Harris
Jackie Hallinan
Rick Roberts
Bill Raney (via conference call)
Karen Price

DEP:
Stephanie R. Timmermeyer, Cabinet Secretary
Randy Huffman, Deputy Cabinet Secretary/Director –Division of Mining & Reclamation
Heather A. Connolly, General Counsel
Karen G. Watson, Assistant General Counsel
Ken Ellison, Director - Division of Land Restoration
Lisa McClung, Director – Division of Water and Waste Management
John Benedict, Director – Division of Air Quality
Mike Zeto, WVDEP
Charlie Sturey, WVDEP
Lalena Price, Acting Chief Communication Officer – WVDEP – Public Information Office
James Martin, Chief, WVDEP - Office of Oil & Gas
Jim Mason – WVDEP
Bill Brannon – WVDEP
Carroll Cather – WVDEP
Terrie Sangid – WVDEP
Scott Mandirola – WVDEP
Cliff Whyte – WVDEP
John Morgan – WVDEP
Gary Rogers – WVDEP
Mike Dorsey – WVDEP
Patrick Campbell – WVDEP
Ken Politan – WVDEP
Pam Nixon – WVDEP

VISITORS:
Don Garvin – WVEC
Allan S. Tweddle – WVEC
Adam Webster – WVRC
Tim Mallan – Appalachian Power
Steve Keen – Bright Enterprises
Charlie Burd – IOGA – WV
Tom Boggs – WV Chamber

Stephanie R. Timmermeyer, Cabinet Secretary - West Virginia Department of Environmental Protection called the meeting to order at 1:00 p.m. Secretary Timmermeyer apologized for short time period with some of the rules getting out to Council.

Proposed rules for the 2007 legislative session are as follows:

60CSR5 – Antidegradation Implementation Procedures

SUMMARY

Antidegradation is a requirement of the federal Clean Water Act intended to preserve the existing quality of the State's waters and to prevent and/or minimize future degradation. The rule was first adopted in 2001 and establishes four levels, or tiers, of protection of State waters, Tiers 1,2,2.5 and 3. Each tier provides a graduated level of protection used during the NPDES permit issuance process.

COMMENTS

Secretary Timmermeyer - Procedural History – 444 Streams to 303 - 3.7% of total WV stream miles.

5.6.d. Are these absolute values (§5.6.d 1-4 of rule)?

Yes

Will there be another comment period after filing with Secretary of State's Office?

Yes

Is this the final list?

Yes

So §6.2 is gone?

Yes

Legislature has to approve the Tier 2.5 list according to the law passed last session.

How do we appeal a stream's inclusion on Tier 2.5 list?

9.6 – Not appealable to the board, delisting a stream would require a change by the legislature through a rule change.

Since rulemaking authority has been taken from EQB how do you appeal?

This is like any other rule, EQB has no appellate jurisdiction.

When does it go into effect?

If the Legislature passes the list, we send it to EPA for approval, then it would be effective for reissuance, modifications, and 1st time issuances.

47CSR2 – Requirements Governing Water Quality Standards

SUMMARY

This rule establishes requirements governing surface water quality standards for the waters of the State and establishes standards of purity and quality consistent with public health and the enjoyment thereof, the protection of animal, aquatic and plant life and the expansion of employment opportunities, agricultural expansion and a foundation for healthy industrial development.

COMMENTS

Secretary Timmermeyer – Overview of nutrients criteria, EPA approved old (46CSR1) Aluminum Standard. Also includes updated list of trout waters.

How were trout streams added?

We relied on DNR's data to come up with the list.

Was it a scientific study or did it include streams where trout are stocked?

The stream must be able to allow trout to survive over time. This does sometimes include stocked streams.

Has problem with some streams listed, believes they are not reproducing streams, simply stocked, wants to see method of gathering data for list

The list is not final, DEP will continue to regulate facilities on such streams. DEP will add and subtract streams as data becomes available.

6 streams are being taken off in this rule because they cannot support trout over time.

How recent are DNR's survey's?

The surveys range from 1975 to present.

We have to maintain waters that "previously sustained trout."

Where is Watershed at in definition?

When permits are issued they are looked at on a case by case basis to assess impact on downstream waters within a watershed (downstream usage protection.)

There is no *definition of "water body" in State Code, only "Waters."*

33CSR9 - Standards for Beneficial Use of Filtrate From Water Treatment Plants

SUMMARY

This legislative rule establishes a mechanism and requirements for the certification, permitting, siting, bonding, and use of water treatment plant sludge from water treatment plants that has beneficial properties. This rule applies to the beneficial use of water treatment plant sludge and to any person who seeks approval from the Secretary to beneficially use such sludge within the state. This rule is intended to enhance the resource recovery and recycling goals of article fifteen of chapter twenty-two of the West Virginia Code and to encourage the beneficial use of water treatment plant filtrate. Section 22-15-23 of the West Virginia Code and this rule, and not the provisions of W. Va. Code § 22-15-10 or 33 CSR 1, shall govern the beneficial use of water treatment plant sludge. This rule does not apply to sewage sludge, products derived from sewage sludge, sludges regulated under 33 CSR 8, or materials regulated as hazardous waste under W. Va. Code §§22-18-1, et seq.

COMMENTS

Can we give an example?

Such filtrate could have been considered Hazardous Waste in the past, this rule allows for certain applications.

47CSR5A – Rules for Individual State Certification of Activities requiring a Federal Permit

SUMMARY

The proposed amendments to this rule are being made to adopt into rule requirements that have been applied through past practices for coal related activities requiring mitigation and issuance of a 401 State Certification of a 404 Permit. Ratios for monetary compensation for temporary impacts are detailed. Monetary compensation for permanent impacts to wetlands

from coal related activities are made the same as non-coal related. Additional economic and stream measurement information is being requested to be added to the 401 application.

COMMENT

Does this apply to any other industry?

No, it is only coal related.

Wants to know if other industry has similar regs?

Seems contrary to what we submit to Army Corp. We want consistency across all forums. Is this different?

No, it is information contained in other forms.

4.2.f.a WV. Jobs creation

Coal companies are already submitting this information to Coal Development. We use this information so we need to see it too.

Is it on a timeframe? – Can coal meet with DEP?

Secretary Timmermeyer suggested we have another Advisory Council Meeting to give the council additional time to review certain rules.

Bill Raney agrees with Secretary Timmermeyer for the need for another meeting to address some of the rules.

The next Advisory Council Meeting will be scheduled before June 20, 2006.

58CSR5 – Recycling Assistance Grant Program

SUMMARY

Updates and streamlines recycling grant requirements. Establishes rule definitions. Consolidates the type of grants available. Simplifies the grant eligibility criteria. Clarifies uses of grant funding. Clarifies and restructures general conditions and requirements for an applicant and then for a grant recipient. Increases the maximum grant funding levels. Clairfies grant proposal content and submission requirements. Establishes agency review criteria and revises Recycling Assistance Fund Grant Review Committee.

COMMENT

Someone worked really hard on putting this together - Really thinks they did a great job.

The changes are a result of suggestions from grant recipients and the recycling community in general.

45CSR6 – Control of Air Pollution from Combustion of Refuse

SUMMARY

This rule establishes emission standards for particulate matter and requirements for activities involving incineration of refuse which are not subject to, or are exempted from regulation under various federal counterpart regulations for specific combustion source categories. This rule also prohibits (with limited exception) open burning and sets forth the registration, permitting, reporting, testing, emergency, natural disaster and exemption provisions for activities involving the combustion of refuse and land clearing debris.

COMMENT

Rule is just reorganizing and streamlining.

Wholesale look at air rules. Four decades old rule. Needed to take a look at its federal counterparts. We separated them (fed) into Rule 18. Rule 6 covers state regs. Streamlined. Did not change any limits. Left open burning and DOH jobs the same.

Both rules compared old "prevent and control" new "control" why drop the term "prevent" from the rule?

We don't prevent air pollution we control it. There is no other specific reason, DEP just cleaned up the title.

The federal government doesn't use the term "prevent" and we are trying to mirror their rules for consistency.

Does it involve timbering operations?

No.

60CSR3 – Voluntary Remediation and Redevelopment Rule

SUMMARY

The Voluntary Remediation Program proposed rule amendments focus on two primary areas: 1. Incorporating the Uniform Environmental Covenant Act provisions, and 2. Updating the DeMinimis Standard to incorporate ;recent changes in toxicological profiles posted by EPA for several constituents.

COMMENT

We're adopting Uniform Environmental Covenant Act. We'll have to adopt as they change. Same for DeMinimus Standards (developed by consultant in excel). We've updated the tox profiles.

No questions from Council.

45CSR25 – Control of Air Pollution from Hazardous Waste Treatment Storage and Disposal Facilities.

SUMMARY

This rule establishes and adopts emission standards for the treatment, storage and disposal of hazardous waste promulgated by the United States Environmental Protection Agency (U.S. EPA) pursuant to the Resource Conservation and Recovery Act, as amended (RCRA). This rule codifies general procedures and criteria to implement emission standards set forth in 40 CFR Parts 260, 261, 262, 264, 265, 266, 270 and 279, as listed in Table 25-A of the rule. The rule also adopts associated appendices, reference methods, performance specifications and other test methods which are appended to these standards. Any person who constructs, reconstructs, modifies or operates any hazardous waste treatment, storage, or disposal facility must comply with the West Virginia Hazardous Waste Management System, the codified federal emission standards, and this rule.

45CSR25 establishes a program of regulation over the treatment, storage, and disposal of hazardous wastes in order to achieve and maintain such levels of air quality as will protect the public health and safety and the environment from the effects of improper, inadequate, or unsound treatment, storage, or disposal of hazardous wastes.

This revised rule incorporates by reference the following provisions of 40 CFR Parts 260, 261, 264, 265, 266 and 270 promulgated as of June 1, 2006: National Emission Standards for Hazardous Air Pollutants: Final Standards for Hazardous Air Pollutants for Hazardous Waste Combustors (Phase I Final Replacement Standards and Phase II), Resource Conservation and Recovery Act Burden Reduction Initiative, and Waste Management System; Testing and Monitoring Activities, Methods Innovation Rule and SW-846 Final Update IIIB.

COMMENT

Revisions to this rule are necessary to maintain consistency with current federal regulations.

Only federal changes this year except for one definition on pathological incinerators.

No further questions.

199CSR1 – Surface Mining Blasting Rule

SUMMARY

These changes are proposed for clarification of definitions, jurisdiction for underground shaft and slope development, and training/educational requirements for pre-blast surveyors and certified blasters. None of which should have any fixcal impact on the state or public above those currently experiencing. Some additional training will be required by those doing pre-blast surveys, but that training will be offered for free by Explosives and Blasting.

COMMENT

Randy Huffman hit on highlight changes and cleanup for this rule:

3.2.c. 1000 ft requirement for seismograph
3.4. defines where DEP gives up regulatory authority as 40ft.
3.9 Pre blast surveyors training requirements.

Is this new or modified requirement?

> *Modified – Now requiring additional criteria. DEP/OEB is the approving authority. We offer procedural training only at DEP 4.1.b. Case by case certification for qualifying experience for initial certification.*

Would that include the convicted felon requirements?

> *The convicted felon exclusion remains. Felons can't get a fire marshal's license, or a license from ATF.*

Any provision for appeals on the convicted felon prohibition?

> *Not at this tme.*

4.5.d – Show cause why you should be allowed in West Virginia when suspended or revoked in other states.
4.9. – Allows blasting inspector to issue suspension order on site if unsafe conditions exist. 24 hour appeal process. Concerned about air blast and fly rock incidents.

Grammatical errors must be changed before we go out to public notice.

Concerns: New definition for "Other structures" and "habitable dwelling"
Shaft and slope (40 ft)

> *Other structures or "Protective structure" can house people – habitable dwelling one that can house people (snowbird example)- "shaft and slope" DEP worked with miner's health and safety to develop the distance criteria.*

We're (WVCA) probably fine with them.

Does OSM require it?

No. Geology and blast record 3.5 Safety concerns pre-blast surveyors, they don't have to be geologists, but they do need to know what they are blasting.

HOLD OVER FOR NEXT MEETING.

38CSR2 – Surface Mining Reclamation Rule

SUMMARY

38- 3.2.g. Notice of Technical Completeness is new language and is to provide the public an opportunity to review the application once technical review is completed. §38- 5.4.e.1 is removing language that is contrary to returning the natural drainway to its original pattern, profile, and dimensions once drainage control structure is removed. Changes to §38-2-6 removals duplication of rules for Blasting and after this change, all the requirements for blasting will be contained in Surface Mining Blasting Rule, Title 199 Series 1. Changes in §38-14.15.c.2, 14.15.d.1and 14.15.d.3 are clarifying contemporaneous reclamation rules on excess spoil disposal. The changes in §38- 5.6 and 14.15 removes phase-in compliance schedules and the schedule in 14.15 has long past and the one in 5.6 is due to expire on June 19, 2006. §38-2-25 Coal Slurry Lines is new language and the term slurry as used in this subsection means any mixture of water and solids that are pumped to a disposal area. The purpose of this change is to minimize the potential and the impacts of slurry line spills by providing for secondary containment, monitoring etc.

COMMENT

Creates standards and requirements (§38-2-25) is a new section.

Public review period 3.2.g. – currently the public has no opportunity to comment on a completed application so this rule adds a 15 day comment period in certain circumstances.

Why delete the term "databases" specifically

Some of those databases don't exist. We have our own database now.

Has the current notification timeframe changed?

No, it is the same as using the existing spill line.

What about mining related spills?

Inspectors call spill line within 24 hour period. Companies should call immediately upon discovering a spill.

Is there anyway to sample water for slurry spills?

Currently DEP Inspectors take stream water samples and that data is on file.

Is there anything dangerous in the slurry to the public?

Not usually. We can get you data on existing samples.

Dialysis system are bothered by trace stuff in the water.

Coal fines are usually what kill fish, not the trace chemicals.

HOLD OVER FOR NEXT AC MEETING

47CSR30 – WV/NPDES RULES FOR COAL MINING FACILITIES

SUMMARY

The proposed amendments to this rule are being made to allow general clean-up of sections referencing outdated names of agencies and references to the EQB governing rule making. This rule addresses the Secretary as being the person as head of all actions. References to the "Director" are changed to "Secretary" to eliminate the need to distinguish between the Director of Mining and Reclamation and the Director of Water and Waste Management when issuing a coal related WV/NPDES permit. This rule adds provision for storm-water coverage for certain minimal activities without the requirement for modification through application to the permit. This rule also provides for an advanced approval of transfer of a WV/NPDES Permit to coincide with the advanced approval of the corresponding Article 3 Permit.

COMMENT

Eliminates need to do a NPDES modification permit in certain instances when adding area to an existing permitted area. Reduce paperwork and manpower.

Secretary can override rule when circumstances dictate. Also, there is a provision for advanced approval of a transfer permit in certain circumstances. Consistent with SMCRA.

Why would a permit area be expanded if not to extract minerals?

Haul roads, storage, etc.

Does this do away with any existing public comment period?

No. These small changes wouldn't require a hearing.

HOLD FOR NEXT MEETING.

35CSR3 – Coalbed Methane Wells Rule –

HOLD FOR NEXT MEETING

33CSR20 – Hazardous Waste Management

HOLD FOR NEXT MEETING

45CSR8 – Ambient Air Quality Standards

SUMMARY

The purpose of this rule is to establish ambient air quality standards for sulfur oxides, particulate matter, carbon monoxide, ozone, nitrogen dioxide and lead, equivalent to those national primary and secondary National Ambient Air Quality Standards (NAAQS) established by the U.S. EPA.

National primary ambient air quality standards define levels of air quality which the Administrator of the U.S. EPA judges are necessary, with an adequate margin of safety, to protect the public health. National secondary ambient air quality standards define levels of air quality which the Administrator of the U.S. EPA judges necessary to protect the public welfare from any known or anticipated adverse effects of a pollutant. Such standards are subject to revision, and additional primary and secondary standards may be promulgated as the Administrator of the U.S. EPA deems necessary to protect the public health and welfare.

The Division of Air Quality (DAQ) is streamlining the regulatory structure by consolidating all of the NAAQS into one rule. Consequently, this rule will repeal and replace 45CSR9 - "Ambient Air Quality Standards for Carbon Monoxide and Ozone" which was filed on April 16, 2002 and became effective on July 1, 2002, and 45CSR12 - "Ambient Air Quality Standard for Nitrogen Dioxide" which was filed May 19, 2000, and became effective June 1, 2000.

COMMENT

This puts all NAAQS in one rule, acts to consolidate and streamline the rule.

Why do away with 2.2?

> *It's now in 3.1 and adopts federal standards.*

Particulates are in this rule. Dr. Popper's (WVU) research shows that particulates damage kid's lungs developmentally and these standards are based on adults. Asthma on the increase and this might exacerbate our kids health.

> The federal EPA is *currently reviewing fine particulate matter and we will change our standards accordingly based on their rule changes.*

45CSR16 – Standards of Performance for New Stationary Sources

SUMMARY

This rule establishes and adopts national standards of performance for new stationary sources and other regulatory requirements promulgated by the United States Environmental Protection Agency (U.S. EPA) pursuant to section 111(b) of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement standards of performance for new stationary sources set forth in 40 CFR Part 60. The rule also adopts associated appendices, reference methods, performance specifications and other test methods which are appended to such standards. Any person who constructs, modifies, reconstructs or operates an affected facility after the effective date of any NSPS under 40 CFR Part 60 must comply with the applicable NSPS and this rule.

This revised rule incorporates by reference the following new or revised NSPS standards promulgated as of June 1, 2006: Standards of Performance for: New and Existing Stationary Sources - Electric Utility Steam Generating Units; Electric Utility Steam Generating Units for Which Construction Is Commenced After September 18, 1978, Industrial- Commercial-Institutional Steam Generating Units, Small Industrial- Commercial- Institutional Steam Generating Units; Stationary Gas Turbines.

COMMENT

Standard Update of fed requirements.

No Questions.

45CSR34 – Emission Standards for Hazardous Air Pollutants

SUMMARY

This rule establishes and adopts national emission standards for hazardous air pollutants (NESHAP) and other regulatory requirements promulgated by the United States Environmental Protection Agency (U.S. EPA) pursuant to section 112 of the federal Clean Air Act, as amended (CAA). This rule codifies general procedures and criteria to implement emission standards for stationary sources that emit, or have the potential to emit, one or more of the hazardous air pollutants set forth in section 112(b) of the CAA, or one or more of the eight substances listed as hazardous air pollutants in 40 CFR §61.01(a). The rule incorporates by reference the NESHAP standards of 40 CFR Parts 61, 63 and 40 CFR Part 65 (Consolidated Federal Air Rule), to the extent referenced in 40 CFR Parts 61 and 63, promulgated as of June 1, 2006. The rule also adopts associated appendices, reference methods, performance specifications and other test methods which are appended to these standards and contained in 40 CFR Parts 61 and 63. Any person who constructs, reconstructs, modifies or operates any source subject to the provisions of 40 CFR Parts 61 or 63 must comply with the applicable NESHAPS and this rule.

This rule will repeal and replace 45CSR15 "Emission Standards for Hazardous Air Pollutants Pursuant to 40 CFR Part 61" filed April 28, 2006 and effective June 1, 2006, as 45CSR34 will now include all federal NESHAPS under 40 CFR Parts 61 and 63.

The revised rule incorporates by reference the following new or revised NESHAP standards promulgated as of June 1, 2006: Miscellaneous Organic Chemical Manufacturing, Waste Management System; Testing and Monitoring Activities, Methods Innovation Rule and SW-846 Final Update IIIB, Cellulose Products Manufacturing, Primary Aluminum Reduction Plants, Cross-Media Electronic Reporting, Hazardous Waste Combustors (Phase I Final Replacement Standards and Phase II), Requirements for Control Technology Determinations for Major Sources in Accordance With Clean Air Act Sections, Sections 112(g) and 112(j), Primary Copper Smelting, Coke Ovens: Pushing, Quenching, and Battery Stacks, Cellulose Products Manufacturing, Miscellaneous Organic Chemical Manufacturing, Secondary Aluminum Production, Brick and Structural Clay Products Manufacturing, Hazardous Waste Combustors, Exemption of Certain Area Sources From Title V Operating Permit Programs, List of Hazardous Air Pollutants, Petition Process, Lesser Quantity Designations, Source Category List, Miscellaneous Coating Manufacturing, Industrial, Commercial, and Institutional Boilers and Process Heaters: Reconsideration, Surface Coating of Metal Cans, Refractory Products Manufacturing, Plywood and Composite Wood Products; List of Hazardous Air Pollutants, Lesser Quantity Designations, Source Category List, Miscellaneous Organic Chemical Manufacturing, Hazardous Waste Combustors, Hydrochloric Acid Production, Industrial Process Cooling Towers, Magnetic Tape Manufacturing Operations, Ethylene Oxide Emissions Standards for Sterilization Facilities, Refractory Products Manufacturing and General Provisions.

COMMENT

Standard update of fed requirements combining 45CSR___ and 45CSR16 into this rule. Will replace Rule 15.

No Questions.

45CSR39 – Control of Annual Nitorgen Oxides Emissions

SUMMARY

This rule establishes general provisions and the designated representative, permitting, allowance, monitoring, and opt-in provisions for the state CAIR NO_X Annual Trading Program pursuant to the federal Clean Air Interstate Rule (CAIR) under Section 110 of the Clean Air Act (CAA), 40 CFR Part 96, Subparts AA through II, and 40 CFR §51.123 for state implementation plans as a means of mitigating interstate transport of fine particulates and nitrogen oxides (NO_X).

This rule partially fulfills the State's obligations in response to the United States Environmental Protection Agency's (U.S. EPA) final rule, *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_X SIP Call* (12 May 2005, at FR 25162). The federal rule requires that large emitters of NO_X reduce annual emissions through the constraint of set budgets. U.S. EPA is specifying that annual NO_X emission reductions be implemented in two phases. The first phase of NO_X reductions starts in 2009; the second phase starts in 2015, and continues thereafter. The NO_X emission reduction requirements are based on controls that are

known to be highly cost effective for electric generating units. Flexibility is built in through market-based "cap and trade" provisions which allow sources to buy or sell NO_X emission allowances from or to other program participants. Reducing upwind NO_X emissions will assist downwind $PM_{2.5}$ and 8-hour ozone nonattainment areas in achieving the National Ambient Air Quality Standards (NAAQS).

45CSR39 applies to large fossil fuel-fired electric generating units that have greater than 25 MW_e generating capacity. The CAIR NO_X Ozone Season Trading Program requirements are set forth in 45CSR40.

COMMENT

Standard update of Fed requirements.
CAIR rules
Picking up EPA rules

Are all the cross-outs just picking up federal standards?

Yes.

No other questions.

45CSR40 – Control of Ozone Season Nitrogen Oxides Emissions

SUMMARY

This rule establishes the general provisions and the designated representative, permitting, allowance, monitoring, and opt-in provisions for the state CAIR NO_X Ozone Season Trading Program pursuant to the federal Clean Air Interstate Rule (CAIR) under Section 110 of the Clean Air Act (CAA), 40 CFR Part 96, Subparts AAAA through IIII, and 40 CFR §51.123 for state implementation plans as a means of mitigating interstate transport of ozone and nitrogen oxides (NO_X).

This rule partially fulfills the State's obligations in response to the United States Environmental Protection Agency's (U.S. EPA) final rule, *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_X SIP Call* (12 May 2005, at FR 25162). The federal rule requires that large emitters of NO_X reduce ozone season emissions through the constraint of set budgets. U.S. EPA is specifying that ozone season NO_X emission reductions be implemented in two phases. The first phase of ozone season NO_X reductions starts in 2009; the second phase starts in 2015, and continues thereafter. The NO_X emission reduction requirements are based on controls that are known to be highly cost effective for electric generating units and large industrial boilers. Flexibility is built in through market-based "cap and trade" provisions which allow sources to buy or sell NO_X emission allowances from or to other program participants. Reducing upwind ozone season NO_X emissions will assist downwind 8-hour ozone nonattainment areas in achieving the National Ambient Air Quality Standards (NAAQS).

Because CAIR subsumes the ozone season NO_X SIP Call trading program, existing NO_X SIP Call rules 45CSR1 and 45CSR26 and their ozone season NO_X reduction provisions must be "sunsetted" by January 1, 2009. Therefore, 45CSR40 contains a repeal clause which

effectively "sunsets" these rules, meeting the approvability requirement for implementing CAIR.

45CSR40 applies to large fossil fuel-fired electric generating units that have greater than 25 MW_e generating capacity and large fossil fuel-fired industrial boilers with a heat input greater than 250 mmBtu/hr. This rule also applies to affected cement kilns and internal combustion engines, by retaining the NO_X SIP Call ozone season NO_X emission reduction requirements for these sources from 45CSR1. These existing requirements do not provide for inclusion in any cap and trade program for cement kilns and internal combustion engines. The CAIR NO_X Annual Trading Program requirements are set forth in 45CSR39.

COMMENT

These changes have they resulted in any change in stringency?

No we are simply streamlining the CAIR rules

We haven't lost any ground?

No.

45CSR1 – Control of Annual Sulfur Dioxide Emissions

SUMMARY

This rule establishes general provisions and the designated representative, permitting, allowance, monitoring, and opt-in provisions for the state CAIR SO_2 Trading Program pursuant to the federal Clean Air Interstate Rule (CAIR) under Section 110 of the Clean Air Act (CAA), 40 CFR Part 96, Subparts AAA through III, and 40 CFR §51.124 for state implementation plans as a means of mitigating interstate transport of fine particulates and sulfur dioxide (SO_2).

This rule partially fulfills the State's obligations in response to the United States Environmental Protection Agency's (U.S. EPA) final rule, *Rule to Reduce Interstate Transport of Fine Particulate Matter and Ozone (Clean Air Interstate Rule); Revisions to Acid Rain Program; Revisions to the NO_X SIP Call* (12 May 2005, at FR 25162). The federal rule requires that large emitters of SO_2 reduce annual emissions based upon the implementation of retirement ratios for SO_2 allowances allocated under the Acid Rain Program. U.S. EPA is specifying that annual SO_2 emission reductions be implemented in two phases. The first phase of SO_2 reductions starts in 2010 and requires retiring SO_2 allowances at a 2:1 ratio; the second phase starts in 2015 and requires retiring SO_2 allowances at a 2.86:1 ratio, and continues thereafter. The SO_2 emissions reductions requirements are based on

controls that are known to be highly cost effective for electric generating units. Flexibility is built in through market-based "cap and trade" provisions which allow sources to buy or sell SO_2 emission allowances from or to other program participants. Reducing upwind SO_2 emissions will assist downwind $PM_{2.5}$ and 8-hour ozone nonattainment areas in achieving the National Ambient Air Quality Standards (NAAQS).
45CSR41 applies to large fossil fuel-fired electric generating units that have greater than 25 MW_e generating capacity.

COMMENT

No questions.

OTHER BUSINESS

Appreciation to Trish White for her work on these rules.

Larry Harris wanted to know about Pocohantas Water Treatment Plant Status? Randy Huffman located Cliff Whyte from DWWM to give him the information.

Trish White will e-mail everyone with next meeting date....

Larry Harris moves we adjourn – Bill Raney seconds.

APPENDIX B

FISCAL NOTE FOR PROPOSED RULES

Rule Title: Reqirements Govering Water Quality Standards, 47CSR2

Type of Rule: [X] Legislative [ ] Interpretive [ ] Procedural

Agency: West Virginia Department of Environmental Protection

Address: 601 57th Street, SE

Charleston, WV 25304

Phone Number: (304) 926-0495 Email: lmcclung@wvdep.org

Fiscal Note Summary

Summarize in a clear and concise manner what impact this measure will have on costs and revenues of state government.

No fiscal impacts on state government are anticipated.

Fiscal Note Detail

Show over-all effect in Item 1 and 2 and, in Item 3, give an explanation of Breakdown by fiscal year, including long-range effect.

	FISCAL YEAR		
Effect of Proposal	Current Increase/Decrease (use "-")	Next Increase/Decrease (use "-")	Fiscal Year (Upon Full Implementation)
1. Estimated Total Cost	0.00	0.00	0.00
Personal Services	0.00	0.00	0.00
Current Expenses	0.00	0.00	0.00
Repairs & Alterations	0.00	0.00	0.00
Assets	0.00	0.00	0.00
Other	0.00	0.00	0.00
2. Estimated Total Revenues	0.00	0.00	0.00

Rule Title: _____

Rule Title: Reqirements Govering Water Quality Standards, 47CSR2

3. **Explanation of above estimates (including long-range effect):**
Please include any increase or decrease in fees in your estimated total revenues.

None anticipated

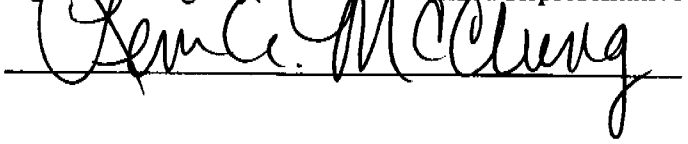
MEMORANDUM

Please identify any areas of vagueness, technical defects, reasons the proposed rule **would not** have a fiscal impact, and/or any special issues **not** captured elsewhere on this form.

The proposed revisions reflect updates identified during the federally mandated triennial review of the Water Quality Standards rule. Costs of implementing the changes will be absorbed in the agency's current budget.

Date: July 28, 2006

Signature of Agency Head or Authorized Representative



TITLE 47
LEGISLATIVE RULES
DEPARTMENT OF ENVIRONMENTAL PROTECTION

SERIES 2
REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

§47-2-1. 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 §22-11-4(a)(16); §22-11-7b

1.3. Filing Date. -- ~~May 10, 2006.~~

1.4. Effective Date. -- ~~June 1, 2006.~~

§47-2-2. 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. "Conventional treatment" is the treatment of water as approved by the West Virginia Bureau for Public Health to assure that the water is safe for human consumption.

2.2. "Cool water lakes" are lakes managed by the West Virginia Division of Natural Resources for cool water fisheries, with summer residence times greater then 14 days.

~~2.2.~~ 2.3. "Cumulative" means a pollutant which increases in concentration in an organism by successive additions at different times or in different ways (bio-accumulation).

~~2.3.~~ 2.4. "Designated uses" are those uses specified in water quality standards for each ~~water body~~ water or segment whether or not they are being attained. (See sections 6.2 - 6.6, herein)

~~2.4.~~ 2.5. "Dissolved metal" is operationally defined as that portion of metal which passes through a 0.45 micron filter.

~~2.5.~~ 2.6. "Existing uses" are those uses actually attained in a ~~water body~~ water on or after November 28, 1975, whether or not they are included in the water quality standards.

~~2.6.~~ 2.7. The "Federal Act" means the Clean Water Act (also known as the Federal Water Pollution Control Act) 33 U.S.C. § 1251 - 1387.

~~2.7.~~ 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.

~~2.8.~~ 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.

~~2.9.~~ 2.10. "Outstanding national resource waters" are those waters whose unique character, ecological or recreational value or pristine nature constitutes a valuable national or State resource.

~~2.10.~~ 2.11. "Natural" or "naturally occurring" values or "natural temperature" shall mean for all of the waters of the state:

~~2.10.a.~~ 2.11.a. Those water quality values which exist unaffected by -- or unaffected as a consequence of -- any water use by any person; and

~~2.10.b.~~ 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 from any point source or non-point source.

~~2.11.~~ 2.12. "Non-point source" shall mean any source other than a point source from which pollutants may reach the waters of the state.

~~2.12.~~ 2.13. "Persistent" shall mean a pollutant and its transformation products which under natural conditions degrade slowly in an aquatic environment.

~~2.13.~~ 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.

~~2.14.~~ 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.

~~2.15.~~ 2.16. "Secretary" shall mean the Secretary of the Department of Environmental Protection or such other person to whom the Secretary has delegated authority or duties pursuant to W. Va. Code §§22-1-6 or 22-1-8.

~~2.16.~~ 2.17. The "State Act" or "State Law" shall mean the West Virginia Water Pollution Control Act, W. Va. Code §22-11-1 et seq.

~~2.17.~~ 2.18. "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.~~ 2.19. "Trout waters" are ~~streams or stream segments~~ waters which sustain year-round trout populations. Excluded are those ~~streams or stream segments~~ waters which receive annual stockings of trout but which do not support year-round trout populations.

~~2.19.~~ 2.20. "~~Water~~ Waters of special concern" are those waters occurring in the categories outlined in section 4.1.c. of the antidegradation policy. This designation provides an intermediate level of antidegradation protection between high quality waters and outstanding national resource waters.

~~2.20.~~ 2.21. "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.

~~2.21.~~ 2.22. "Water quality standards" means the combination of water uses to be protected and the water quality criteria to be maintained by these rules.

~~2.22.~~ 2.23. "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.

~~2.23.~~ 2.24. "Wet weather streams" are streams that flow only in direct response to precipitation or whose channels are at all times above the water table.

§47-2-3. 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 Secretary 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.

§47-2-4. Antidegradation Policy.

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

4.1.a. Tier 1 Protection. 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~~ water on or after November 28, 1975, whether or not they are included as designated uses within these water quality standards.

4.1.b. Tier 2 Protection. 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 Secretary 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 (BMPs) for non-point source control. If BMPs are demonstrated to be inadequate to reduce or minimize water quality impacts, the Secretary may require that more appropriate BMPs be developed and applied.

4.1.b.1. High quality waters are those waters meeting the definition at section ~~2.7~~ 2.8 herein.

4.1.b.2. High quality waters may 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 §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. Tier 2.5 Protection. Waters of special concern include all of those waters listed in 60 C.S.R. 5, Appendix A. Waters of special concern may include, but are not limited to naturally reproducing trout streams, federally designated rivers under the "Wild and Scenic Rivers Act," 16 U. S.C. §§ 1271 et seq., waters in state parks and forests, waters in National parks and forests, waters designated under the "National Parks and Recreation Act of 1978," and waters with unique or exceptional aesthetic, ecological, or recreational value. Waters may be nominated for inclusion in this category by any interested party or by the ~~Board~~ Secretary on ~~its~~ his or her own initiative.

In addition to the Waters of Special Concern outlined in 60 CSR 5 - "Antidegradation Implementation Procedures", Appendix A, the following streams are classified as Waters of Special Concern:

4.1.c.1. Watkins Run (Preston County) ~~and;~~

4.1.d. Tier 3 Protection. 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 Secretary on his or her own initiative. To designate a nominated water as an outstanding national resource water, the Secretary 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.

§47-2-5. Mixing Zones.

5.1. In the permit review and planning process or upon the request of a permit applicant or permittee, the Secretary 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 Secretary 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 Secretary 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, Table 1 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 Secretary. 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 Secretary, the size of the zone shall be determined using one of the four alternatives outlined in section 4.3.3 of US EPA's 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, Table 1 shall not be allowed at any point unless a mixing zone has been assigned by the Secretary after consultation with the Commissioner of the West Virginia Bureau for 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 Secretary 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, 15 U.S.C. §1531 et seq.

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 (1/2) 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~~ water.

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 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 3, herein.

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 1/2 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 Act shall constitute compliance with all provisions of this section.

5.2.j. The Secretary may waive the requirements of subsections 5.2.e and 5.2.h.2 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 subsections 5.2.d and 5.2.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 Secretary that the mixing zone is in compliance with the provisions outlined in subsections 5.2.b, 5.2.c, 5.2.e, and 5.2.h.2, herein.

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

§47-2-6. 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 Federal 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 section 301(b) and section 306 of the Federal 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~~ water 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~~ water 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~~ water, 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 Secretary shall follow the requirements for revision of water quality standards as required by W. Va. Code §22-11-7b 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 Secretary'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.2, herein for additional requirements for Category A waters.) The manganese human health criterion shall only apply within the five-mile zone immediately upstream above a known public or private water supply used for human consumption.

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 populations composed of all warm water aquatic life.

6.3.b. Category B2 -- Trout Waters. -- As defined in section ~~2.20~~ 2.19, herein (See Appendix A for a representative list.)

6.3.c. Category B4 -- Wetlands. -- As defined in section ~~2.24~~ 2.23, herein; certain numeric stream criteria may not be appropriate for application to wetlands (see Appendix E, Table 1).

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 (1/2) 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.

§47-2-7. 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:

7.1.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, herein.

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 (1/2) 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, herein. In addition, within that one half (1/2) mile zone, the Secretary 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.) Until September 1, 2010, or until action by the Secretary to revise this provision, whichever comes first, the one-half (1/2) mile zone described in this section shall not apply to the Ohio River main channel (between Brown's Island and the left descending bank) between river mile points 61.0 and 63.5 for the Category A criterion for iron as set forth in §8 herein. Weirton Steel Corporation shall conduct monthly monitoring of the treated water at its drinking water plant for iron and submit the results of such monitoring to the West Virginia Bureau for Public Health and the Office of Water Resources of the West Virginia Department of Environmental Protection. In addition, Weirton Steel Corporation shall submit a written report regarding the status of its drinking water plant and the issues pertaining thereto to the Secretary on or before March 1, 2007.

7.2.b. In the absence of any special application or contrary provision, 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: With the exception of section 7.2.c.5 listed herein exceptions do not apply to trout waters nor to the requirements of section 3, herein.

7.2.c. Exceptions: Numeric water quality standards shall not apply: (See section 7.2.d, herein, 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 section 5 herein shall apply to all zones of initial dilution and all mixing zones;

7.2.c.4. Where, on the basis of natural conditions, the Secretary has established a site-specific aquatic life water quality criterion that modifies a water quality criterion set out in Appendix E, Table 1 of this rule. Where a natural condition of a ~~waterbody~~ water is demonstrated to be of lower quality than a water quality criterion for the use classes and subclasses in section 6 of this rule, the Secretary, in his or her discretion, may establish a site-specific water quality criterion for aquatic life. This alternate criterion may only serve as the chronic criterion established for that parameter. This alternate criterion must be met at end of pipe. Where the Secretary decides to establish a site-specific water quality criterion for aquatic life, the natural condition constitutes the applicable water quality criterion. A site-specific criterion for natural conditions may only be established through the legislative rulemaking process in accordance with W.Va. Code §29A-3-1 et seq. and must satisfy the public participation requirements set forth at 40 C.F.R. 131.20 and 40 C.F.R. Part 25. Site-specific criteria for natural conditions may be established only for aquatic life criteria. A public notice, hearing and comment period is required before site-specific criteria for natural conditions are established.

Upon application or on its own initiative, the Secretary will determine whether a natural condition of a ~~waterbody~~ water should be approved as a site-specific water quality criterion. Before he or she approves a site-specific water quality criterion for a natural condition, the Secretary must find that the natural condition will fully protect existing and designated uses and ensure the protection of aquatic life. If a natural condition of a ~~waterbody~~ water varies with time, the natural condition will be determined to be the actual natural condition of the ~~waterbody~~ water measured prior to or concurrent with discharge or operation. The Secretary will, in his or her discretion, determine a natural condition for one or more seasonal or shorter periods to reflect variable ambient conditions; and require additional or continuing monitoring of natural conditions.

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

7.2.c.4.A. A U.S.G.S. 7.5 minute map showing the stream segment affected and showing all existing discharge points and proposed discharge point;

7.2.c.4.B. The alphanumeric code of the affected stream, if known;

7.2.c.4.C. Water quality data for the stream or stream segment. Where adequate data are unavailable, additional studies may be required by the Secretary;

7.2.c.4.D. General land uses (e.g. mining, agricultural, recreation, residential, commercial, industrial, etc.) as well as specific land uses adjacent to the waters for the affected segment or stream;

7.2.c.4.E. The existing and designated uses of the receiving waters into which the segment in question discharges and the location where those downstream uses begin to occur;

7.2.c.4.F. General physical characteristics of the stream segment, including, but not limited to width, depth, bottom composition and slope;

7.2.c.4.G. Conclusive information and data of the source of the natural condition that causes the stream to exceed the water quality standard for the criterion at issue.

7.2.c.4.H. The average flow rate in the segment and the amount of flow at a designated control point and a statement regarding whether the flow of the stream is ephemeral, intermittent or perennial;

7.2.c.4.I. An assessment of aquatic life in the stream or stream segment in question and in the adjacent upstream and downstream segments; and

7.2.c.4.J. Any additional information or data that the Secretary deems necessary to make a decision on the application.

7.2.c.5. For the upper Blackwater River from the mouth of Yellow Creek to a point 5.1 miles upstream, when flow is less than 7Q10. Naturally occurring values for Dissolved Oxygen as established by data collected by the dischargers within this reach and reviewed by the Secretary shall be the applicable criteria.

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 section ~~8.3~~ 8.4 and section ~~8.4~~ 8.5, herein) The following are approved site-specific criteria, variances and use reclassifications:

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

7.2.d.2. Potomac River

7.2.d.2.1. ~~Except that a~~ 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 - (Reserved)

~~7.2.d.6.1 Except that the Stony River downstream from the limit of the thermal mixing zone (as established by Environmental Quality 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. This exception shall apply until the successful completion of a study conducted pursuant to section 316(a) of the Federal Act or December 31, 1998, whichever comes first.~~

7.2.d.7. Monongahela River

7.2.d.7.1. ~~Except that flow~~ 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.8. Cheat River

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

7.2.d.9. Blackwater River - ~~The Blackwater River below Davis, West Virginia shall be classified as a trout water, Category B2.~~ (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 - (Reserved)

~~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~~ 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 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 a~~ 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: Lead 14 ug/l, Daily Maximum, Temperature 100 degree 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). Weirton Steel Corporation shall continue to submit to the Secretary, on an annual basis summary reports on the water quality of the discharge from Outlet 004 and the efforts made by Weirton Steel Corporation during the previous year to improve the quality of the discharge. These exceptions shall be in effect until action by the Secretary to revise the exceptions or until July 1, ~~2007~~ 2008, whichever comes first.

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.19.3. ~~Except that a~~ A variance pursuant to 46 CSR 6, Section 5.1, based on naturally occurring pollutant concentrations, shall apply to Union Carbide Corporation's discharge to Ward Hollow of Davis Creek, which shall have the instream criteria for chlorides of 310 mg/l for Category A and C waters and for Category B1 (chronic aquatic life protection). This exception shall be in effect until action by the ~~appropriate rulemaking authority~~ Secretary to revise the exception or until July 1, 2008, whichever comes first.

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~~ The stretch between the mouth of Little Scary Creek (K-31) and the Little Scary impoundment shall not have Water Use Category A. The following site-specific numeric criteria shall apply to that section: 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 Simmons Creek (K-54) from its mouth to a point 1200 feet upstream to which the following site specific numeric criteria 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 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.30. Greenbrier River - (Reserved)

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

7.2.d.32. Bluestone Lake - (Reserved)

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)

§47-2-8. Specific Water Quality Criteria.

8.1. Charts of specific water quality criteria are included in Appendix E, Table 1.

8.1.a. Specific state (i.e. total, total recoverable, dissolved, 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 47 C.S.R. 10, section 7.3 - National Pollutant Discharge Elimination System (NPDES) Program.)

8.1.b. Compliance with aquatic life water quality criteria expressed as dissolved metal shall be determined based on dissolved metals concentrations.

8.1.b.1. The aquatic life criteria for all metals listed in Appendix E, Table 2 shall be converted to a dissolved concentration by multiplying each numerical value or criterion equation from Appendix E, Table 1 by the appropriate conversion factor (CF) from Appendix E, Table 2.

8.1.b.2. Permit limits based on dissolved metal water quality criteria shall be prepared in accordance with the U.S. EPA document "The Metals Translator: Guidance For Calculating A Total Recoverable Permit Limit From A Dissolved Criterion, EPA 823-B-96-007 June 1996.

8.1.b.3. NPDES permit applicants may petition the Secretary to develop a site-specific translator consistent with the provisions in this section. The Secretary may, on a case-by-case basis require an applicant applying for a translator to conduct appropriate sediment monitoring through SEM/AVS ratio, bioassay or other approved methods to evaluate effluent limits that prevent toxicity to aquatic life.

8.1.c. An "X" or numerical value in the use columns of Appendix E, Table 1 shall represent the applicable criteria.

8.1.d. Charts of water quality criteria in Appendix E, Table 1 shall be applied in accordance with major stream and use applications, sections 6 and 7, herein.

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, Table 1 with an endnote ([b]).

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. Criteria for Nutrients in Lakes

8.3.a. This subsection establishes nutrient criteria designed to protect Water Use Categories B and C. The following cool water nutrient criteria shall apply to cool water lakes. (See Appendix F for a representative list.) The following warm water nutrient criteria shall apply to all other lakes with a summer residence time greater than 14 days.

8.3.b. Total phosphorus shall not exceed 50 µg/l for warm water lakes and 30 µg/l for cool water lakes based on an average of four or more samples collected during the period May 1–October 31. In lieu of such sampling, impairment may be evidenced at any time by noncompliance with section 3.2, as determined by the Secretary. Chlorophyll-a shall not exceed 30 µg/l for warm water lakes and 15 µg/l for cool water lakes based on an average of four or more samples collected during the period May 1–October 31. In lieu of such sampling, impairment may be evidenced at any time by noncompliance with section 3.2, as determined by the Secretary.

~~8.3.~~ 8.4. 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~~ paragraphs 6.1.b.1 through 6.1.b.6, herein, 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 Secretary at least every three years. In granting a variance, the requirements for revision of water quality standards in 46 CSR 6 shall be followed.

~~8.4.~~ 8.5. Site-specific numeric criteria. The Secretary may establish numeric criteria different from those set forth in Appendix E, Table 1 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 Effect Ratio study pursuant to the procedures outlined in US EPA's "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 Secretary. In adopting site-specific numeric criteria, the requirements for revision of water quality standards set forth in 46 CSR 6 shall be followed.

§47-2-9. 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 Secretary where necessary to protect State waters 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 Secretary 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 Secretary 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 Secretary and shall submit all of the following in writing to the Secretary:

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 Secretary.

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 Secretary.

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 ~~2.20~~ 2.19.

River Basin	County	Stream
James River		
J-1-A	Mercer	Ewin Run
J-3	Monroe	Cove Creek
J-1-D	Monroe	North Fork of Potts Creek
J-1-E	Monroe	South Fork Potts Creek
Potomac River		
P-5	"Berkeley	~~Hartland~~Harland Run
P-4-J	"Berkeley	Middle Creek (Above Route 30 Bridge)
P-4-M	"Berkeley	Mill Creek
P-6-B	"Berkeley	Mill Run
P-4	Berkeley	Opequon Creek
P-6-A	"Berkeley	Tillance Creek
P-4-C	"Berkeley	Tuscarora Creek (Above Martinsburg)
P-3	"Jefferson	Rocky Marsh Run
P-2.3	Jefferson	Town Run
P-9-B	Morgan	Meadow Branch
SNF-1	Hardy	Capon Run
~~P~~S-6	"Jefferson	Big Bullskin Run
~~P~~S-2	"Jefferson	Cattail Run
~~P~~S-4	"Jefferson	Evitt's Run
~~P~~S-1	Jefferson	Flowing Springs Run (Above Halltown)
~~P~~S-7	"Jefferson	Long Marsh Run
PC-9	Hampshire	Cold Stream
PC-11	"Hampshire	Dillons Run
PC-10	"Hampshire	Edwards Run ~~and Impoundment~~
PC-17	Hampshire	Hawk Run of Cacapon
PC-24-E-1	"Hardy	Camp Branch
PC-24	Hardy	Lost River
PC-24-H	"Hardy	Lower Cove Run of Lost River
PC-20	"Hardy	Moores Run
PC-7	"Hardy	North River (Above Rio)
PC-23-A-1-(L1)	"Hardy	Rock Cliff Lake (Impoundment)
PC-23-A-1-(L2)	"Hardy	Trout Pond (Impoundment)
PC-23	"Hardy	Trout Run of Cacapon
PC-22	"Hardy	Waites Run
~~PC~~	"	~~Warden Lake (Impoundment)~~
PSB-28-A-1	Grant	Big Run of Jordan Run
PSB-28-E	Grant	High Ridge Run of North Fork
PSB-28-A-2	Grant	Laurel Run of Jordan
PSB-26-E	Grant	North Fork Lunice Creek
PSB-29	Grant	Redman Run
PSB-28-B	Grant	Samuel Run of North Fork
PSB-25-C-2	"Grant	Spring Run of South Mill Creek

River Basin	County	Stream
Potomac River		
PSB-26-D	"Grant	South Fork Lunice Creek
PSB-25-C	"Grant	South Mill Creek (Above Hiser)
PSB-28	Grant-Pendleton	North Fork South Branch
PSB	Grant- "Pendleton	South Branch (Above North Fork)
PSB-9	Hampshire	Mill Creek
PSB-13	"Hampshire	Mill Run of South Branch
PSB-21-F	Hardy	Dumpling ~~Creek~~ Run
PSB-28-EE-2-A	Pendleton	Back Run of Sawmill Branch
PSB-28-EE	"Pendleton	Big Run of North Fork
PSB-28-R	Pendleton	Blizzard Run
PSB-28-S	Pendleton	Brier Gap Run
PSB-32	Pendleton	Briggs Run of South Branch
PSB-28-C	Pendleton	Broad Run of North Fork
PSB-28-K-1	Pendleton	Brushy Run of Seneca Creek
PSB-28-EE-4	Pendleton	Elk Run of Big Run
PSB-21-X	Pendleton	Hawes Run (Impoundment)
PSB-28-K-3	Pendleton	Horsecamp Run of Seneca Creek
PSB-28-GG	"Pendleton	Laurel Fork of North Fork - to VA line
PSB-28-T	Pendleton	Laurel Run of North Fork
PSB-21-GG	"Pendleton	Little Fork
PSB-28-GG-1-B	Pendleton	Little Low Place Hollow of Laurel Fork
PSB-28-K-2-B	Pendleton	Long Run of Roaring Creek
PSB-28-I	Pendleton	Powdermill Run of North
PSB-33	Pendleton	Reeds Creek
PSB-28-K-2	Pendleton	Roaring Creek of Seneca Creek
PSB-21-K	Pendleton	Rough Run of South Branch
PSB-28-GG-1-A	Pendleton	Sams Run of Laurel Fork
PSB-28-EE-2	Pendleton	Sawmill Branch of Big Run
PSB-28-EE-3	Pendleton	Teeter Camp Run
PSB-28-K	"Pendleton	~~Senena~~ Seneca Creek
PSB-28-K-4	Pendleton	Strader Run of Seneca Creek
PSB-47	Pendleton	Thorn Creek
PSB-28-K-6-B	Pendleton	Upper Gulf Run of Whites Run
PSB-28-GG-1	Pendleton	Vance Run of Laurel Fork
PSB-28-K-3-B	Pendleton	Wamsley Run
PSB-28-K-6	Pendleton	Whites Run of Seneca Creek
PSB-21-I-1	Pendleton	Wilson Run of Kettle Creek
PNB-18	Grant	Difficult Creek of North Branch
PNB-17	Grant	Stony River Upstream of Mount Storm Lake
PNB-23	Grant	Wilsonia Run of North Branch
PNB-16-B-1	Grant	Wycroff Run of Abrams Creek
PNB-15-A	Mineral	Cranberry Run of Deep Creek Run
PNB-15	Mineral	Deep Run of North Branch
~~PNB~~	"	~~Fort Ashby (Impoundment)~~
PNB-14	Mineral	Howell Run of North Branch
PNB-4-S	"Mineral	Mill Creek (Above Markwood)
PNB-7	"Mineral	New Creek
PNB-7-H-(L1)	"Mineral	New Creek Dam 14 (Impoundment)
PNB-4-EE	Mineral	North Fork Patterson Creek
PNB	Pendleton	North Branch of Potomac
PNB-16-B	Grant	Johnnycake Run of Wycroff Run

River Basin	County	Stream
Ohio River		
O-98-A	Hancock	North Fork of Kings Creek
O-88-D-2	Ohio	Middle Wheeling Creek
Monongahela River		
M-16	Monongalia-Marion	Whiteday Creek (Above Smithtown)
MC-2-0.5A	"Monongalia	Blaney Hollow
MC-6-(L1)	"Monongalia	Coopers Rock (Impoundment)
MC-2	Monongalia	Morgan Run
MCS-56	Pocahontas	Oats Run of Shavers Fork
MC-12	Preston	Big Sandy
MC-33	"Preston	Buffalo Creek
MC-12-B-5	Preston	Cherry Run of Little Sandy
MC-20	"Preston	Elsey Run
MC-33-A	Preston	Flag Run of Buffalo Creek
MC-12-A	Preston	Laurel Run of Big Sandy
MC-12-B	Preston	Little Sandy
MC-12-B-6	Preston	Mill Run of Little Sandy
MC-17	Preston	Muddy Creek
MC-12-B-4.5	Preston	Piney Run of Little Sandy
~~MT~~ MC-18	Preston	Roaring Creek (Above Little Lick Branch)
MC-32	"Preston	Saltlick Creek
MC-36	"Preston	Wolf Creek
MC-41	Preston-Tucker	Long Run
MC-54-K	Preston-Tucker	Twelvemile Run of Clover
MC-60-K-6	Randolph	Baker Camp Run
MC-60-T-8	Randolph	Big Run of Gandy
MC-60-T-13	Randolph	Big Run of Gandy (above the sinks)
MC-60-O-1	Randolph	Big Run of Red Creek
MC-60-N-10	Randolph	Camp Five Run
MC-60-K-14	Randolph	Daniels Creek
MC-60-T-10.5	Randolph	Devers Run of Gandy
MC-60	"Randolph	Dry Fork (Above Otter Creek)
MC-60-K-17	"Randolph	East Fork Glady Fork (Above C & P Compressor Station)
MC-60-K-4	Randolph	Five Lick
MC-60-O-2	Randolph	Flatrock Run
MC-60-T-(S)	"Randolph	Gandy Creek ~~(Above Whitmer)~~
MC-60-K	"Randolph	Glady Fork
MC-60-T-9	Randolph	Grants Branch
MC-60-Q	Randolph	Horsecamp Run
MC-60-N	"Randolph	Laurel Fork
MC-60-T-1	Randolph	Lower Two Spring Run
MC-60-K-11	Randolph	McCray Creek
MC-60-T-10	Randolph	Narrow Ridge Run
MC-60-K-2	Randolph	Panther Camp Run
MC-60-T-10-(L1)	"Randolph	Spruce Knob Lake (Impoundment)
MC-60-P	Randolph	Spruce Run
MC-60-T-3	Randolph	Swallow Rock Run
MC-60-T-6	Randolph	Taylor Run
MC-60-K-1	"Randolph	Three Spring Run
MC-60-R	Randolph	Tory Camp Run
MC-60-T-2	Randolph	Upper Two Spring Run

River Basin	County	Stream
Monongahela River		
MC-60-T-11	Randolph	Warner Run
MC-60-K-16	Randolph	West Fork of Glady - exclude lower 2 miles
MC-60-K-5	Randolph	Woodford Run
MCS	Randolph-Pocahontas	Shavers Fork (Above Little Black Fork)
MC-60-K-17-0.5A	Randolph	White Run of East Fork of Glady
MC-33-A-1-A	Tucker	Aarons Run of Pheasant Run
MC-60-L	Tucker	Big Run of Dry Fork
~~MC~~	"	~~Blackwater River (Above Davis)~~
MC-60-D	"Tucker	Blackwater River ~~(Below Davis)~~
MCS-7.5	Tucker	Canoe Run
MC-51	Tucker	Clover Run
MC-55	Tucker	Dry Run
MC-60-C	"Tucker	Elklick Run of Black Fork
MC-60-J	Tucker	Elklick Run of Dry Fork
MC-60-O-3	Tucker	Gandy Run of Red Creek
MC-54-D	Tucker	Hyle Run of Horseshoe Run
MC-51-B-5	Tucker	Indian Run
MC-54-I	Tucker	Leadmine Run of Horseshoe Run
MC-51-B	Tucker	Left Fork of Clover Run
MC-54-E	Tucker	Lick Drain
MC-54-G	Tucker	Lynn Run
MC-54-C	"Tucker	Maxwell Run of Horseshoe
MC-54-A	Tucker	Mike Run of Horseshoe
MC-56	Tucker	Mill Run of Cheat River
MC-60-I	Tucker	Mill Run of Dry Fork
MC-51-B-2	Tucker	Mill Run of Left Fork of Clover
MC-52	Tucker	Minear Run of Cheat
MC-60-O	"Tucker	Red Creek
MC-60-G	Tucker	Red Run
MC-46-B	Tucker	Right Fork of Bull Run
MC-51-A	Tucker	Right Fork of Clover Run
MC-60-D-10	Tucker	Sand Run
MC-56-B	"Tucker	Slip Hill Mill Branch
MC-60-D-3-(L1)	"Tucker	Thomas Park (Impoundment)
MC-54-H	Tucker	Thunderstruck Run of Horseshoe
MC-45	Tucker	Tobes Run
MC-60-K-0.5	Tucker	Two Spring Run of Glady Fork
MC-51-B-4	Tucker	Valley Fork
MC-57	Tucker	Wolf Run of Cheat River
MC-60-D-11	Tucker	Yoakum Run
MC-54	"Tucker-Preston	Horseshoe Run (Headwaters) to Leadmine
MCS-54	Pocahontas	Second Fork
MCS-53	Randolph	Beaver Creek
MCS-57	Randolph	Black Run
MCS-47	Randolph	Blister Run
MCS-14	Randolph	Clifton Run
MCS-50	Randolph	First Fork
MCS-48	Randolph	Fish Hatchery Run
MCS-33	Randolph	Fishing Hawk Creek
MCS-43	Randolph	Glade Run
MCS-16	Randolph	Johns Run
MCS-49	Randolph	Lambert Run

River Basin	County	Stream
Monongahela River		
MCS-13	Randolph	Little Black Fork
MCS-12	Randolph	Little Laurel Run
MCS-9	Randolph	Nail Run
MCS-15	Randolph	Rattlesnake Run
MCS-46	Randolph	Red Run of Shavers Fork
MCS-22-A	Randolph	Stalnaker Run
MCS-22	Randolph	Taylor Run
MCS-44	Randolph	Whitmeadow Run
MCS-40	Randolph	Yokum Run
MCS-4	Tucker	Jobs Run
MCS-5	Tucker	Laurel Run of Shavers Fork
MCS-3-A	Tucker	South Branch of Haddix Run
MCS-6-B	Tucker	Aarons Run
MCS-7	Tucker	Stonelick Run
~~MW~~	~~Harrison~~	~~Dog Run (Pond)~~
MW-38-(L1)	Lewis	Stonecoal Lake
MT-23-C	Barbour	Brushy Fork (Above Valley Furnace)
MT-23-F	"Barbour	Mill Run
MT-23-H	Barbour	Mill Run of Teter Creek
~~MT~~	"	~~Teter Creek Lake (Impoundment)~~
MT-38	Barbour	Zebs Creek
MT-12-G-3	Preston	Boyds Run
MT-12-G	Preston	Fields Creek
MT-18-E-4-B	Preston	Frog Run
MT-12-D	Preston-Taylor-Monongalia	Laurel Run of Threeforks
MT-66-C	Randolph	Back Fork of Riffle Creek
MT-47	Randolph	Beaver Creek
MT-50-A	Randolph	Right Fork Files Creek
MT-68	Randolph	Becky Creek from secondary Rt 56 bridge upstream
MT-68-A	Randolph	Big Branch of Becky Creek
MT-81	"Randolph	Big Run of Tygart
MT-73	Randolph	Clay Run
MT-77	Randolph	Conley Run
MT-74	"Randolph	Elkwater Fork above Mowry Run
MT-50	Randolph	Files Creek (Rt. FK-MT-50-A) from compressor station upstream
MT-64-C	Randolph	Glade Run
MT-72	Randolph	Hamilton Run
MT-50-B	Randolph	Left Fork of Files Creek
MT-50-A-1	Randolph	Limekiln Run
MT-74-B	Randolph	Limekiln Run of Elkwater
MT-80	Randolph	Logan Run
MT-44	Randolph	Mathais Run
MT-66-B	Randolph	McGee Run
MT-64-E	Randolph	Meatbox Run
MT-33	Randolph	Middle Fork (Upper) above Cassity
MT-64	Randolph	Mill Creek upstream at end of Co. Rt. 46/4
MT-50-A-2	Randolph	Millstone Run Right Fork of Files Creek
MT-74-A	Randolph	Mowry Run
MT-64-F	Randolph	Potatohole Fork
MT-67	Randolph	Rafe Run
MT-78	Randolph	Ralston Run

River Basin	County	Stream
Monongahela River		
MT-66	Randolph	Riffle Creek - above McGee Run
MT-45-C	Randolph	Right Fork of Chenoweth Creek
MT-61	Randolph	Shavers Run
MT-75	Randolph	Stewart Run
MT	Randolph	Tygart River (Above Huttonsville)
MT-79	Randolph	Windy Run
MT-(T1)	Taylor-Barbour	Tygart Lake Tailwaters (Above Route 119 Bridge)
MTB-32-H	Randolph	Beech Run
MTB-31-I	Randolph	Devil Fork
MTB-31-C	Upshur	Alec Run
MTB-28	Upshur	Big Run of Buckhannon (Above DLM drain)
MTB	Upshur	Buckhannon River (Above Beans Mill)
MTB-18	Upshur	French Creek
MTB-32-E	Upshur	Lick Run
MTB-31-D	Upshur	Millsite Run
MTB-27	Upshur	Panther Fork (headwaters) - from 2 miles above Co. Rt. 32
MTB-31-B	Upshur	Reger Run
MTB-25-A	Upshur	Right Fork of Tenmile Creek - except lower ½ mile
MTB-32-D	Upshur-Randolph	Bearcamp Run
MTB-32	Upshur-Randolph	Left Fork Buckhannon
MTB-31-F	Upshur-Randolph	Left Fork Right Fork
MTB-31	Upshur-Randolph-Lewis	Right Fork Buckhannon River
MTM-26	Randolph	Birch Fork of Middle Fork
MTM-16	Randolph	Cassity Fork (Upper) - above Mulberry Run
MTM-28	Randolph	Kittle Creek
MTM-23	Randolph	Laurel Branch
MTM-22	Randolph	Laurel Run of Middle Fork
MTM-13	Randolph	Long Run
MTM	Randolph	Middle Fork River (Above Cassity)
MTM-27	Randolph	Mitchell Lick Fork
MTM-16-A	Randolph	Panther Run of Cassity Fork (Upper) except lower 1/4 mile
MTM-21	Randolph	Pleasants Run
MTM-26-B	Randolph	Rocky Run of Birch Fork
MTM-25	Randolph	Schoolcraft Run
MTM-24-A	Randolph	Spice Run
MTM-24	Randolph	Sugar Run
MTM-11-E	Upshur	Jenks Fork
~~MTN~~ MTM-11	Upshur	Right Fork Middle Fork River
MTM-11-D	Upshur-Randolph	Jackson Fork
MY-5	Preston	Maple Run
MY-4	Preston	Rhine Creek
MY-2	Preston	Snowy Creek
MY	Preston	Youghiogheny River
Little Kanawha River		
LK-131	Upshur	Getout Run
LK-115-H	Upshur	Left Fork-Right Fork (Little Kanawha River)
LK	Upshur-Lewis	Little Kanawha River (Above Wildcat)

River Basin	County	Stream
Kanawha River		
K-80	Fayette	Falls Creek
K-76	Fayette	Loop Creek
K-65-H	Fayette	Ash Branch
K-76-M	Fayette	Open Fork
K-65	Fayette	Paint Creek(Pax to Burnwell)
K-76-N-1	Fayette	Taylor Branch
KC-31-B	Boone	Hopkins Fork
KC-47	Raleigh	Clear Fork
KC-46	"Raleigh	Marsh Fork (Above Sundial)
KC-46-Q-1-(L1)	Raleigh	Stephens Lake (Impoundment)
KE-102-A	Braxton	Camp Creek (Centralia)
~~KE~~	"	~~Sutton Lake Tailwaters (Above Route 38/5 Bridge)~~
~~KE~~	~~Braxton~~	~~Sutton Reservoir~~
KE-91	Braxton	Wolf Creek (Centralia)
KE-43	Clay	Blue Knob Creek
KE-69	Clay	Groves Creek
KE-50-I	Clay	Rockcamp Run
KE-74	Clay	Strange Creek
KE-76-O	Nicholas	Poplar Creek
KE-76-L-5	Nicholas	Tug Fork
KE-135	Pocahontas	Big Run of Elk
KE-138	Pocahontas	Big Spring Fork
KE-139-B	Pocahontas	Crooked Fork
KE-138-B	Pocahontas	Cup Run
KE-133	Pocahontas	Dry Fork
KE-137	Pocahontas	Laurel Run of Elk
KE-136	Pocahontas	Props Run
KE-139-0.5A	Pocahontas	Slaty Fork
KE-130	Randolph	Chimney Rock Run
KE-129	Randolph	Valley Fork
KE-117-B	Randolph-Webster	Right Fork of Leatherwood
KE-111	Webster	Back Fork of Elk
KE-127	Webster	Big Run of Elk
KE-98-B-16	"Webster	Desert Fork (Headwaters) above Roaring Run
KE	"Webster	Elk River (Above Webster Springs)
KE-98-C-14	"Webster	Fall Run
KE-102	Webster	Laurel Creek (Erbacon)
KE-98-C-11	"Webster	Laurel Fork of Left Fork of Holly
KE-98-C	"Webster	Left Fork Holly River
KE-111-K-2	Webster	Little Sugar Creek
KE-111-K	"Webster	Sugar Creek (Headwaters) above Little Sugar
KE-118	Webster-Randolph	Bergoo Creek
KG-19-J	Fayette	Brackens Creek
KG-19-A	Fayette	Dogwood Creek
KG-19-E	Fayette	Glade Creek
KG-6	Fayette	Rich Creek
KG-19-O.7	Fayette	Surbaugh Creek

River Basin	County	Stream
Kanawha River		
KG-34-H-14	Greenbrier	Bear Run
KG-34-G-8	Greenbrier	Becky Run
KG-34-E-8	Greenbrier	Beech Run
KG-19-U	Greenbrier	Big Clear Creek
KG-34-G-13	Greenbrier	Big Run of South Fork of Cherry
KG-34-G-2	Greenbrier	Briery Run
KG-19-U-1	Greenbrier	Brown Creek
KG-34-H-5	Greenbrier	Coats Run
KG-34-G-10	Greenbrier	Cold Knob Fork
KG-34-E-13	Greenbrier	Cold Spring Branch
KG-34-G-5	Greenbrier	Elklick Run
KG-34-E-9	Greenbrier	Hogcamp Run
KG-34-F-2	Greenbrier	Improvement Branch
KG-19-U-2-D	Greenbrier	Job Knob Branch
KG-19-V-7	Greenbrier	Kuhn Branch
KG-19-V	"Greenbrier	Little Clear Creek ~~and Laurel Run~~
KG-19-V-5	Greenbrier	Laurel Creek
~~KG~~KNG-28-P	"Greenbrier	Meadow Creek
KG-34-E-11	Greenbrier	Middle Branch
KG-19-U-2-C	Greenbrier	Old Field Branch
KG-34-G-6	Greenbrier	Rocky Run
KG-19-U-3	Greenbrier	Sam Creek
KG-34-H-5-(L1)	Greenbrier	Summit Lake
KG-34-E	Greenbrier-Nicholas	Laurel Creek
KG-34-H	"Greenbrier-Nicholas	North Fork Cherry River
KG-34-G	Greenbrier-Nicholas	South Fork Cherry River
KG-19-G	"Nicholas	Anglins Creek (Headwaters) - 41/9 bridge upstream
KG-26-K	Nicholas	Brushy Fork
KG-24-E-2	Nicholas	Brushy Meadow Creek
KG-34	Nicholas	Cherry River
KG-20	Nicholas	Collison Creek
KG-32-J	Nicholas	Cranenest Run
KG-24-B	Nicholas	Deer Creek
KG-24-E	Nicholas	Grassy Creek
KG-24	Nicholas	Hominy Creek
KG-32	Nicholas	Panther Creek
KG-13	Nicholas	Peters Creek
KG-24-H.8	Nicholas	Price Fork
KG-(L1)	Nicholas	Summersville Reservoir (Impoundment)
KG-(T)	"Nicholas	Summersville Tailwaters (Above Collison Creek)
KG-34-F	Nicholas-Greenbrier	Little Laurel Creek
KG-34-H-4	Nicholas-Randolph	Hunters Run
KG-34-H-17	Pocahontas	Darnell Run of North Fork of Cherry
KG-72	Randolph-Pocahontas	Middle Fork of Gauley
KG-73	Randolph-Pocahontas	North Fork of Gauley
KG	Randolph-Webster	Gauley River (Above Moust Coal Tipple)
KG-45	Webster	Big Laurel Creek
KG-59	Webster	Big Run of Gauley
KG-70	Webster	Big Run of Gauley
KG-61	Webster	Hughes Run
KG-58	Webster	Laurel Creek of Gauley
KG-57	Webster	Miller Mill Run

River Basin	County	Stream
Kanawha River		
KG-60-A	Webster	Right Fork of Turkey Creek of Gauley
KG-67	Webster	Straight Creek of Gauley
KG-60	Webster	Turkey Creek
KG-65	Webster	Williams Camp Run
KGC-3	Nicholas	Jakeman Run
KGC-4-A	Nicholas	Little Barrenshe
KGC-4	Pocahontas	Barrenshe Run
KGC-24	Pocahontas	North Fork of Cranberry (Only the Catch & Release Area)
KGC-23-C	Pocahontas	Red Run of South Fork of Cranberry
KGC-23	Pocahontas	South Fork Cranberry River
KGC	Pocahontas-Webster-Nicholas	Cranberry River
KGC-19	Randolph	Dogway Fork
KGC-9	Webster	Aldrich Run
KGC-8	Webster	Foxtree Run
KGC-15	Webster	Hanging Rock Branch
KGC-7	Webster-Nicholas	Bee Run
KGW-26	Pocahontas	Black Mountain Run
KGW-25	Pocahontas	Day Run
KGW-20-A	Pocahontas	Lick Creek
KGW-22	Pocahontas	Little Laurel Creek
KGW-27	Pocahontas	Mountain Lick Run
KGW-21	Pocahontas	Sugar Creek
KGW-20	Pocahontas	Tea Creek
KGW-10	Pocahontas-Webster	Middle Fork of Williams
KGW	Pocahontas-Webster	Williams River ~~(Above Dyer)~~
KGW-1	Webster	Craig Run
KGW-2	Webster	Jonathan Run
KGW-9	Webster	Lick Branch
KGW-3	Webster	Sawyer Run
KGW-4	Webster	Spice Run
KGW-8	Webster	White Oak Fork
KN-23	Fayette	Buffalo Creek
KN-27-C	Fayette	Chestnut Knob Fork of Laurel
KN-22	Fayette	Dunloup Creek ~~(Downstream from Harvey Sewage Treatment Plant)~~
KN-17-A	Fayette	Glade Creek of Manns
KN-27	"Fayette	Laurel Creek ~~(Above Cotton Hill)~~ of New River
KN-7	Fayette	Mill Creek
~~KG~~ KN-10	Fayette	Wolf Creek
KN-60	Mercer	East River (Above Kelleysville)
KN-60-B	"Mercer	Pigeon Creek
KN-51-H-(S)	Monroe	Laurel Creek
KN-61	Monroe	Rich Creek
KN-51-O	"Monroe	Turkey Creek
KN-26-F	Raleigh	Beaver Creek
KN-26-B	Raleigh	Fat Creek
KN-29	Raleigh	Glade Creek of New River
KN-29-E	Raleigh	Pinch Creek
KN-26	Raleigh	Piney Creek
KN-32	Summers	Meadow Creek

River Basin	County	Stream
Kanawha River		
KNB-13	"Mercer	Camp Creek
KNB-30	Mercer	Crane Creek
KNB-12-B	Mercer	Laurel Creek (Bluestone)
KNB-13-D-1	Mercer	Marsh Fork
KNB-3	Summers	Little Bluestone River
KNG-28	"Greenbrier	Anthony Creek (Above Big Draft)
KNG-30-0.5A-1-A	Greenbrier	Burns Run
KNG-30-0.5A-1-(S)	Greenbrier	Culverson Creek
KNG-22-E-1-B	Greenbrier	Flynn Creek
KNG-22-E-1-A-(S)	Greenbrier	Hughart Creek
KNG-22.7-A-1-(S)	"Greenbrier	Milligan Creek
KNG-28-P	Greenbrier	North Fork Anthony Creek
KNG-30-0.5A-1-C-1-(S)	Greenbrier	Roaring Creek
KNG-30	"Greenbrier	Spring Creek
KNG-28-P-2	Greenbrier	Twomile Run
KNG-23	Greenbrier-Monroe	Second Creek (Rt. 219 Bridge to Nickell's Mill)
KNG-23-G	Monroe	Kitchen Creek (Above Gap Mills)
KNG-78-L	"Pocahontas	Abes Run
KNG-53-G	Pocahontas	Barclay Run
KNG-47	"Pocahontas	Beaver Creek
KNG-68-A-5	Pocahontas	Black Run
KNG-78-C-1-(L1)	"Pocahontas	Buffalo Fork (Impoundment)
KNG-79-C-2	Pocahontas	Clubhouse Run
KNG-68	"Pocahontas	Deer Creek
KNG-53-H	Pocahontas	Douthat Creek
KNG-78	Pocahontas	East Fork of Greenbrier
KNG-68-A-6	Pocahontas	Elleber Run
KNG-79-B	Pocahontas	Fill Run
KNG-78-G	"Pocahontas	Five Mile Run
KNG	"Pocahontas	Greenbrier River (Above Hosterman)
KNG-68-A-6-A	Pocahontas	Griffin Run
KNG-30-0.7A-1-(S)	"Pocahontas	Hills Creek
KNG-78-A	Pocahontas	Johns Run
KNG-53	"Pocahontas	Knapp's Creek
KNG-60	Pocahontas	Laurel Run of Greenbrier
KNG-70	Pocahontas	Leatherbark Run
KNG-78-C	"Pocahontas	Little River-East Fork
KNG-79-C	"Pocahontas	Little River-West Fork
KNG-38	Pocahontas	Locust Creek
KNG-78-H-1	Pocahontas	Long Run
KNG-78-K	"Pocahontas	Mullenax Run
KNG-68-A	"Pocahontas	North Fork Deer Creek ~~(Above Route 28/5)~~ FS bridge below Sutton Run to head
KNG-78-H	Pocahontas	Poca Run
KNG-59-D-(L1)	"Pocahontas	Seneca (Impoundment)
KNG-66-D	Pocahontas	Shock Run
KNG-66	"Pocahontas	Sitlington Creek
KNG-79-C-1	Pocahontas	Spanoak
KNG-55	"Pocahontas	Stoney Creek
KNG-68-A-3	Pocahontas	Sutton Run of North Fork of Deer Creek
KNG-49	"Pocahontas	Swago Creek

River Basin	County	Stream
Kanawha River		
KNG-68-A-4	Pocahontas	Tacker Fork
KNG-59	Pocahontas	Thorny Creek
KNG-74	Pocahontas	Trout Run of Greenbrier
KNG-43-(L1)	Pocahontas	Watoga Lake
KNG-79	"Pocahontas	West Fork Greenbrier ~~(Above the impoundment at the tannery)~~
OG-124	Wyoming	Pinnacle Creek ~~creek~~
OG-131	Wyoming	Barker's Creek
OG-137	Wyoming	Devil's Fork
OG-131-F	Wyoming	Gooney Otter Creek
OG-134	Wyoming	Slab Fork
OG-139	Wyoming	Stonecoal Creek
OG-138	Wyoming	Winding Gulf
Tug Fork of Big Sandy River		
BST-70	McDowell	Dry Fork ~~(Above Canebrake)~~ of Tug
BST-99	McDowell	Elkhorn Creek
BST-70-W	McDowell	Jacob Fork

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, herein.

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

River Basin	County	Operating Company	Source
Monongahela River			
MC	Preston	Kingwood Water	Cheat River
MC	Preston	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	"	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 River
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

River Basin		County	Operating Company	Source
Ohio River				
O	Zone 1	Hancock	Chester Water & Sewer	Ohio River
O	"	Brooke	City of Weirton	Ohio River
O	Zone 1	Brooke	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	"	Cabell	Huntington Water Corp.	Ohio River
O	"	Marshall	Mobay Chemical Co.	Ohio River
O	"	Wood	E. I. DuPont	Ohio River
O	Zone 2	Marshall	Meron Water	Glass House Hollow
O	"	"	New Urindahana Water	Wheeling Creek System
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
O	"	Wayne	Wayne Municipal Water	Twelve Pole Creek
O	"	"	East Lynn Lake	East Lynn Lake
O	"	"	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.-	Unnamed Tributary Kanawha Beards Fork

River Basin	County	Operating Company	Source
Kanawha River			
K	Kanawha	Midland Trail School	Impoundment
K	"	Cedar Coal Co.	Impoundment
K	Fayette	Elkem Metals Co.	Kanawha River
K	Fayette	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

River Basin	County	Operating Company	Source
New River			
KN	Fayette	Ames Heights Water	Mill Creek
KN	"	Mt. Hope Water	Impounded Mine (Surface)
KN	Fayette	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 River
Guyandotte River			
OG	Cabell	Salt Rock PSD	Guyandotte River
OG	Lincoln	West Hamlin Water	Guyandotte River
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

River Basin	County	Operating Company	Source
Guyandotte River			
OG	Wyoming	Pineville Water	Pinnacle Creek/
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	Putnam	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, herein.

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	Kammer	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, herein.

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/ Stonecoal Lake	Lewis

River Basin	Stream Code	Stream	County
Ohio	O	OhioRiver	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

River Basin	Stream Code	Stream	County
Kanawha	KG	Gauley River/ Summersville Lake	Nicholas
	KGW	Williams River	Webster

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.1 Dissolved Aluminum (ug/l) ~~Not to exceed [e]:~~	750xCF[5]	~~87~~ 750xCF[5] [e]	750xCF[5]	87xCF[5] [e]			
8.2. Acute and chronic aquatic life criteria for ammonia shall be determined using the National Criterion for Ammonia in Fresh Water[d] from USEPA's 1999 Update of Ambient Water Quality Criteria for Ammonia (EPA-822-R-99-014, December 1999)	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 Dissolved Trivalent Arsenic ~~Not to exceed:~~	360 x CF[5]	190 x CF[5]	360 x CF[5]	190 x CF[5]			
8.5 Barium (mg/l) ~~Not to exceed:~~						1.0	
8.6 Beryllium (ug/l)	130		130			.0077	
8.7 Cadmium (ug/l) Hardness (mg/l $CaCO_3$) / Soluble Cd 0 - 35 / 1.0 36 - 75 / 2.0 76 - 150 / 5.0 > 150 / 10.0						X	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.7.1 ~~Not to exceed~~ 10 ug/l in the Ohio River (O Zone 1) main stem (see section 7.1.d, herein)						X	
8.7.3 The four-day average concentration of dissolved cadmium ~~shall not exceed the value~~ determined by the following equation: ~~$Cd = e^{(0.7852[\ln(hardness)]-3.490)} \times CF^5$~~ $Cd = e^{(0.7409[\ln(hardness)]-4.719)} \times CF^5$		X		X			
8.7.4 The one-hour average concentration of dissolved cadmium ~~shall not exceed the value~~ determined by the following equation: ~~$Cd = e^{(1.128[\ln(hardness)]-3.828)} \times CF^5$~~ $Cd = e^{(1.0166[\ln(hardness)]-3.924)} \times CF^5$	X		X				
8.8 Chloride (mg/l)	860	230	860	230	250	250	
8.9.1 Chromium, dissolved hexavalent (ug/l): ~~Not to exceed:~~	16 x CF^5	11 x CF^5	16 x CF^5	7.2 x CF^5		50	
8.9.2 Chromium, trivalent (ug/l) The one-hour average concentration of dissolved trivalent chromium ~~shall not exceed the value~~ determined by the following equation: ~~$\exp\{0.8190[\ln(hardness)]+3.7256\} \times (CF^5)$~~ $CrIII = e^{(0.8190[\ln(hardness)]+3.7256)} \times CF^5$	X		X				
8.9.3 The four-day average concentration of dissolved trivalent chromium ~~shall not exceed the value~~ determined by the following concentration: ~~$\exp\{0.8190[\ln(hardness)]+0.6848\} \times (CF^5)$.~~ $CrIII = e^{(0.8190[\ln(hardness)]+0.6848)} \times CF^5$		X		X			

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.10 Copper (ug/l) ~~Not to exceed:~~						1000	
8.10.1 The four-day average concentration of dissolved copper ~~shall not exceed the value~~ determined by the following equation[a]: ~~$Cu = e^{(0.8545[ln(hardness)]-1.465)} \times CF^5$~~ $Cu = e^{(0.8545[ln(hardness)]-1.702)} \times CF^5$		X		X			
8.10.2 The one-hour average concentration of dissolved copper ~~shall not exceed the value~~ determined by the following equation[a]: ~~$Cu = e^{(0.9422[ln(hardness)]-1.464)} \times CF^5$~~ $Cu = e^{(0.9422[ln(hardness)]-1.700)} \times CF^5$	X		X				
8.11 Cyanide (ug/l) (As free cyanide $HCN+CN^-$) ~~Not to exceed:~~	22	5.0	22	5.0	5.0	5.0	
8.12 Dissolved Oxygen[c]: not less than 5 mg/l at any time.	X				X	X	X
8.12.1 Kanawha River main stem, Zone 1 - Not less than 4.0 mg/l at any time.	X						
8.12.2 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						

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.12.3 Not less than 7.0 mg/l in spawning areas and in no case less than 6.0 mg/l at any time.			X				
8.13 Fecal Coliform: Maximum allowable level of fecal coliform content for ~~Primary~~ Water 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	
8.13.1 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		
8.14 Fluoride (mg/l) ~~Not to exceed:~~						1.4	
8.14.1 Not to exceed 2.0 for category D1 uses.							X
8.15 Iron[c] (mg/l) ~~Not to exceed:~~		1.5		0.5		1.5	
8.16 Lead (ug/l) ~~Not to exceed:~~						50	
8.16.1 The four-day average concentration of dissolved lead ~~shall not exceed the value~~ determined by the following equation[a]: $Pb = e^{(1.273[\ln(\text{hardness})]-4.705)} \times CF^{5}$		X		X			

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.16.2 The one-hour average concentration of dissolved lead ~~shall not exceed the value~~ determined by the following equation[8]: $Pb = e^{(1.273[\ln(hardness)]-1.46)} \times CF^5$	X		X				
8.17 Manganese (mg/l) (see §6.2.d) ~~Not to exceed:~~						1.0	
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			
Nickel (ug/l) ~~Not to exceed:~~					4600	510	
8.19.1 The four-day average concentration of dissolved nickel ~~shall not exceed the value~~ determined by the following equation[8]: ~~$Ni = e^{(0.846[\ln(hardness)]+1.1645)} \times CF^5$~~ $Ni = e^{(0.846[\ln(hardness)]+0.0584)} \times CF^5$		X		X			
8.19.2 The one-hour average concentration of dissolved nickel ~~shall not exceed the value~~ determined by the following equation[8]: ~~$Ni = e^{(0.846[\ln(hardness)]+3.361)} \times CF^5$~~ $Ni = e^{(0.846[\ln(hardness)]+2.255)} \times CF^5$	X		X				
8.20 Nitrate (as Nitrate-N) (mg/l)						10	

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
8.21 Nitrite (as Nitrite-N) (mg/l) ~~Not to exceed:~~	1.0		.060				
8.22 Nutrients							
Chlorophyll –a (µg/l) (see §47-2-8.3)							
Total Phosphorus (µg/l) (see §47-2-8.3)							
~~8.22~~ 8.23 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		3.0		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
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	

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
Hexachlorobenzene[b] (ng/l)					0.77	0.72	
Carbon tetrachloride[b] (ug/l)					4.4	0.25	
Chloroform[b] (ug/l)					470	5.7	
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)					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	
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	

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
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	
~~8.22.1~~ 8.23.1 ~~The organic chemicals listed in §8.22 shall not exceed the specified water quality criteria~~. When the specified criteria for organic chemicals listed in §8.23 are less than the practical laboratory quantification level, instream values will be calculated from discharge concentrations and flow rates, where applicable.							
~~8.23~~ 8.24 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~~ 8.25 Phenolic Materials							
~~8.24.1~~ 8.25.1 Phenol (ug/l) ~~Not to exceed:~~					4,600,000	21,000	
~~8.24.2~~ 8.25.2 2-Chlorophenol (ug/l) ~~Not to exceed:~~					400	120	
~~8.24.3~~ 8.25.3 2,4-Dichlorophenol (ug/l) ~~Not to exceed:~~					790	93	
~~8.24.4~~ 8.25.4 2,4-Dimethylphenol (ug/l) ~~Not to exceed:~~					2300	540	

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.24.5~~ 8.25.5 2,4-Dinitrophenol (ug/l) ~~Not to exceed:~~					14,000	70	
~~8.24.6~~ 8.25.6 Pentachlorophenol[b] (ug/l)					8.2	0.28	
~~8.24.6.a~~ 8.25.6.a The one-hour average concentration of pentachlorophenol ~~shall not exceed the value~~ determined by the following equation: exp(1.005(pH)-4.869)	X		X				
~~8.24.6.b~~ 8.25.6.b The 4-day average concentration of pentachlorophenol ~~shall not exceed the value~~ determined by the following equation: exp(1.005(pH)-5.134).		X		X			
~~8.24.7~~ 8.25.7 2,4,6-Trichlorophenol[b] (ug/l) ~~Not to exceed:~~					6.5	2.1	
~~8.25~~ 8.26 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

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.25.1~~ 8.26.1 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
~~8.26~~ 8.27 Selenium (ug/l) ~~Not to exceed:~~	20	5	20	5		10	
~~8.27~~ 8.28 Silver (ug/l) Hardness / Silver 0-50 / 1 51-100 / 4 101-200 / 12 >201 / 24				X		X	
~~8.27.1~~ 8.28.1 0-50 / 1 51-100 / 4 101-200 / 12 201-400 / 24 401-500 / 30 501-600 / 43		X					

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C^3	A^4	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.27.2~~ 8.28.2 The one-hour average concentration of dissolved silver ~~shall not exceed the value~~ determined by the following equation: ~~$Ag=e^{(1.72[\ln(hardness)]-6.52)}$ x CF[5]~~ $Ag=e^{(1.72[\ln(hardness)]-6.59)}$ x CF[5]	X		X				
~~8.28~~ 8.29 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.	X						
~~8.28.1~~ 8.29.1 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						

APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.28.2~~ 8.29.2 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				
~~8.28.3~~ 8.29.3 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				

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.28.4~~ 8.29.4 For Ohio River Main Stem (01) (see section 7.1.d, herein): Dates — Period Ave. — Inst. 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~~ 8.30 Thallium (ug/l)					6.3	1.7	
~~8.30~~ 8.31 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~~ 8.32 Total Residual Chlorine (ug/l - measured by amperometric or equivalent method) ~~Not to exceed:~~	19	11					

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.31.1~~ 8.32.1 No chlorinated discharge allowed			X				
~~8.32~~ 8.33 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. 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	
~~8.32.1~~ 8.33.1 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	

47CSR2
APPENDIX E, TABLE 1

PARAMETER	USE DESIGNATION						
	AQUATIC LIFE				HUMAN HEALTH		ALL OTHER USES
	B1, B4		B2		C[3]	A[4]	
	ACUTE[1]	CHRON[2]	ACUTE[1]	CHRON[2]			
~~8.33~~ 8.34 Zinc (ug/l) The four-day average concentration of dissolved zinc ~~shall not exceed the value~~ determined by the following equation[a]: ~~$Zn = e^{(0.8473[\ln(\text{hardness})]+0.7614)} \times CF^5$~~ $Zn = e^{(0.8473[\ln(\text{hardness})]+0.884)} \times CF^5$		X		X			
~~8.33.1~~ 8.34.1 The one-hour average concentration of dissolved zinc ~~shall not exceed the value~~ determined by the following equation[a]: ~~$Zn = e^{(0.8473[\ln(\text{hardness})]+0.8604)} \times CF^5$~~ $Zn = e^{(0.8473[\ln(\text{hardness})]+0.884)} \times CF^5$	X		X				

[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. Concentration not to be exceeded, 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. Concentration not to be exceeded, unless otherwise noted.
[5] The appropriate Conversion Factor (CF) is a value used as a multiplier to derive the dissolved aquatic life criterion is found in Appendix E, Table 2.
[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.
[d] The early life stage equation in the National Criterion shall be used to establish chronic criteria throughout the state unless the applicant demonstrates that no early life stages of fish occur in the affected water(s).
[e] ~~Until July 4, 2007, the aluminum criteria will be implemented as follows: the chronic aluminum criterion shall be 87 ug/l for trout waters (as defined in section 2.20 of this rule) and shall be 750 ug/l for all other waters of the state. The implementation of the interim criteria provides time for a study to develop aluminum criteria for waters of the state which are based upon sound science and are protective of aquatic life.~~

APPENDIX E
TABLE 2

Conversion Factors

Metal	Acute	Chronic
Aluminum	1.000	1.000
Arsenic (III)	1.000	1.000
Cadmium	1.136672-[(ln hardness)(0.041838)]	1.101672-[(ln hardness)(0.041838)]
Chromium (III)	0.316	0.860
Chromium(VI)	0.982	0.962
Copper	0.960	0.960
Lead	1.46203-[(ln hardness)(0.145712)]	1.46203-[(ln hardness)(0.145712)]
Nickel	0.998	0.997
Silver	0.85	N/A
Zinc	0.978	0.986

APPENDIX F
COOL WATER LAKES

This list contains lakes to be managed for cool water fisheries and is not intended to exclude any waters which meet the definition in Section 2.2.

River Basin	County	Lake
Potomac River		
PC	Hardy Lost River	Trout Pond (Impoundment)
PC	Hardy Lost River	Rock Cliff Lake (Impoundment)
PSB	Pendleton	Hawes Run (Impoundment)
PNB	Mineral	New Creek Dam 14(Impoundment)
Monongahela River		
MC	Monongalia	Coopers Rock (Impoundment)
MC	Monongalia	Cheat Lake
MC	Tucker	Thomas Park (Impoundment)
MC	Randolph	Spruce Knob Lake (Impoundment)
MT	Taylor	Tygart Lake
MW	Lewis	Stonecoal Lake
Kanawha River		
KC	Raleigh	Stephens Lake (Impoundment)
KG	Nicholas	Summersville Reservoir (Impoundment)
KG	Greenbrier	Summit Lake (Impoundment)
KNG	Pocahontas	Watoga Lake
KNG	Pocahontas	Buffalo Fork (Impoundment)
KNG	Pocahontas	Seneca (Impoundment)
KCG	Pocahontas	Handley Pond
Guyandotte River		
OG	Wyoming/Mingo	RD Bailey Lake

WEST VIRGINIA
DEPARTMENT OF ENVIRONMENTAL PROTECTION
DIVISION OF WATER AND WASTE MANAGEMENT

PUBLIC HEARING ON RULE 47CSR2

REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

JULY 17, 2006

Original

On the 17th day of July, 2006, beginning at 6:00 p.m., at the offices of the West Virginia Department of Environmental Protection, 601 57th Street, Kanawha City, Kanawha County, West Virginia, before James D. Nielsen, Court Reporter and a Notary Public in and for the State of West Virginia, a public hearing was taken in the above-named action pursuant to notice of the West Virginia Department of Environmental Protection, Division of Water and Waste Management.

ACCURATE REPORTING SERVICE, INC.
526 SEVENTH STREET
HUNTINGTON, WEST VIRGINIA 25701

(304) 345-9891 * (304) 522-9637 * (606) 329-2154

APPEARANCES:

On Behalf of the West Virginia Department of Environmental Protection:

Karen Watson: Assistant General Counsel for the Division of Environmental Protection

Patrick Campbell: Assistant Director of the Division of Water and Waste Management

Scott Mandirola: Assistant Director of Water Quality Standards Program

Lalena Price: Public Information Office, Department of Environmental Protection

I N D E X

PROCEEDING

MS. PRICE: Good evening, my name is Lalena Price and I work with the Public Information Office here at the DEP. I'm the acting spokesperson for the agency, so I'll be facilitating the meeting tonight.

Welcome to the DEP and the Public Hearing for Requirements Governing Water Quality Standards 47CSR2, which establishes requirements governing surface water quality standards for the waters of the state and establishes standards of purity and quality.

Please make sure you have signed in and indicate if you're going to make a comment. We are pleased you made the trip here tonight and are participating in our rule-making process. We will be accepting your comments, both written and oral, this evening. Please note that the comment period officially closes at the end of this meeting.

If you already have submitted or are going to submit written comments, you do not also have to make them orally. Written comments are as much a part of the record as oral comments.

Please submit those by the end of the hearing.

We are here tonight to listen to you and to include your thoughts in the official record. We understand that you may also have some questions. A question in and of itself is a meaningful comment. Please enter your questions into the record along with your comments and we will respond to those as well.

We have three representatives here tonight, two are from the Division of Water and Waste Management, and they're here to listen to your comments. Patrick Campbell, on the far end, is the Assistant Director of Water and Waste Management. In the middle there is Scott Mandirola, Assistant Director of Water Quality Standards Program. Karen Watson, here on the end, is the Assistant General Counsel for the DEP.

Briefly, the DEP is proposing several changes to this rule, including clerical corrections, changes and updates to the language of the rule involving nutrient criteria for phosphorous and chlorophyll A, dissolved aluminum, and the trout water list.

The rule also extends the exceptions for Harmon Creek from July 1st, 2007, to July 1st, 2008, to allow Weirton Steel Corporation to complete the requested biological assessment of the stream as well as to submit additional information as requested by the agency.

Before we begin accepting comments, I'm going to ask any of you who want to make comments on the record for the recycling rule and the surface mine rule to let me know if you want to do that, you can go first. As soon as you make your comments we'll take you down the hall to the other hearing so you can also make your comments on the record there.

Thanks so much for your patience and we'll just get started. First up to speak, Ernie Nester.

MR. ERNIE NESTER: Hello, my name is Ernie Nester, I live in Fallsview, Fayette County. We moved to West Virginia in 1966, so I have been trout fishing in West Virginia since 1966 and have managed to get around to a few streams in West Virginia.

My comments are simply going to be about

the definition of trout waters and the B2 trout list. My brief comments, the definition or the proposed definition, Section 2.19, I'll read it, Trout Waters are waters which sustain year-round trout population. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations. That's the end of the proposed section.

Now, in the current or old B2 list of trout waters I think there's only about roughly 160 trout waters listed, which obviously doesn't even come close to including all of the trout waters of West Virginia. Now, the new list, the proposed B2 list contains, I think, something over 490 trout waters. So progress is being made. So that's a definite improvement over the old list of 160.

And I have always contended that it would be good to have a better list of the trout streams for companies who are planning projects on waters, to know what kind of stream they're discharging into, for DEP, for the Highway Department and anyone else who is concerned about the waters, the trout waters of West Virginia.

Now, it would be good to have a B2 list that included absolutely every trout stream in West Virginia, but considering past and current funding for the West Virginia Department of Natural Resources, that is going to be a very difficult or if not impossible task to ever come up with a complete list of all the trout streams in West Virginia.

So that's why it's very important that this definition of trout waters be retained at all stages. Thank you.

MS. PRICE: Thank you. Next up, Ed Hayne.

MR. ED HAYNE: I'm Ed Hayne, and I live in Charleston. I want to speak tonight particularly about the trout stream definition. I think it's critical that the definition retain year-round trout streams, not necessarily just reproducing trout streams. And the importance of that is the fact in a lot of situations the tributaries supply young-of-the-year fish that feed out into the bigger streams and live there year-round.

So we want the definition to include

year-round trout waters. I think that is very, very critical. You take that out and you're really going to reduce the list, and that really shouldn't happen.

The DNR has done a very good job of adding to the list, like Ernie mentioned. There is quite a few more trout streams on the list than were initially there, the B2 list I'm talking about.

Now, it's critical that the list be accurate, just like Ernie said. Accuracy is paramount in this program. And it's no secret that there's an awful lot of trout streams that are not currently on the new B2 list. It has 492 trout streams. I'd bet my last nickel there is hundreds, hundreds more. They've never been surveyed. The survey work has just not been done. They're out there. And that needs to be done.

I want to read something that the DEP put out here. It says, The list generally is composed of streams documented as having natural reproduction, and streams that sustain trout year round but do not have documented natural

reproduction. The only way to assess that is through surveys.

And it goes on to say that the draft list of trout waters is more comprehensive than any that have been previously published, that is true. The draft list contains known trout waters but is not meant to exclude any waters that meet the definition. As more survey information is accumulated in the future it is likely that more streams will be added to the list. I'm here to tell you, you could add to that list, you could double it.

Now, those surveys have got to be done. They haven't been completed. I think that there is a major effort right now among many fisherman, concerned anglers that are working hard to identify streams that should be on the B2 list but they're not currently there.

I spent my last weekend in the mountains of Pendleton County reassessing a couple streams that I have on my data bank. And I was with my wife, and that's pretty much what we did, we drove around Pendleton County and stopped at these streams. It was a great weekend standing

knee deep in a wild trout stream. I had a bald eagle fly over my head on Seneca Creek, that's pretty special.

Now, the streams that are submitted by the Coldwater Management Section of the DNR, hopefully they're going to go back out and get a lot of the survey data quickly. If any additional funds are needed, I think that should be included in this program, because it's going to cost money, time and effort and manpower to go back out and get this data that should be made a priority.

Looking at the B2 list it's apparent that there's an awful lot of streams that are on that B2 list that really should have been rolled right over into the Tier 2.5 list. A lot of the DNR data shows reproduction in trout streams on the B2 list and they're not to be found in the Tier 2.5 data, and I don't think that's right. I think there is an awful lot of B2 streams that should be bumped right on up to the 2.5 list.

Hopefully as the process moves forward our lawmakers will help provide the protection that our clean streams of wild trout deserve.

Thank you.

MS. PRICE: Thank you. Next up, Larry Orr.

MR. LARRY ORR: My name is Larry Orr, I'm the chairman of the West Virginia Council of Trout Unlimited, 1,600 dues-paying members strong. Our mission is to conserve, protect and restore the coldwater fisheries of West Virginia and their watersheds.

I came to West Virginia in 1961, and when I came to West Virginia, the Kanawha River around Charleston, you didn't swim in it or play in it. I went to work for Union Carbide as a chemical process design engineer and project manager and worked for them for 38 years. We were good corporate citizens, we worked on reducing the pollution of the streams. We worked on taking care of the thermal degradation of the cooling water that we returned to the streams. And today there are people fishing in the Kanawha River. We were good corporate citizens, and I see no reason why the extractive industry should not be held to the same kind of standards.

The B2 list is a start. You've heard

people talk about the definition, I want to reiterate, the definition must not be changed. There are hundreds of streams that they're not on that list. There are people that want to change the definition to include only streams with reproducing trout, we don't want to do that. That would be a very bad thing.

The streams as their managed now, if the DEP or DNR knows that a stream has year-round trout populations, they are managed as a B2 stream. We need to retain that definition. We absolutely need to retain that definition.

In closing, Trout Unlimited with the Eastern Brook Trout Joint Venture produced a report for the status and threats of the streams in West Virginia. I'd like to briefly read you a sentence or two from that.

The majority of West Virginia's remaining brook trout sub-watersheds are greatly reduced largely due to poor water quality associated with a long history of poor land management, forestry and mining. In addition, acid deposition and abandoned mine drainage each impair approximately 25 percent of available

brook trout habitat.

We need to protect our streams and we definitely need to retain that current definition of the B2 streams. Thank you.

MS. PRICE: Next up, Charlie Nichols.

MR. CHARLIE NICHOLS: Good evening, everyone, I'm Charlie Nichols and I'm from Charleston, West Virginia.

I'm going to pass that to you, it's a card that took me a long time to earn. That card is a West Virginia Division of Environmental Protection Certified Volunteer Monitor, stream monitor. I'm here tonight to encourage the West Virginia Division of Environmental Protection to keep the language of title 47CSR2 defining trout waters as it is now, year-round trout waters.

I want to gave you a little bit of my history. In August of 1986 I joined the Kanawha County Chapter of Trout Unlimited. For nearly two decades now I've devoted over 200 hours a year on B2 waters in the State of West Virginia. As I count that up that's nearly two years of work in the State of West Virginia on B2 waters.

It's been interesting. It's been

invigorating. It's been great for my family. I've been able to take my daughter and son out on B2 waters and they have enjoyed it. Industry and trout can live side by side in the state of West Virginia.

I love the habitat where trout live so much so that I spent the last three years as a certified volunteer stream monitor for the Division of Environmental Protection. I've spent two days every year for the last three years monitoring Old Field Fork in Pocahontas County. Old Field Fork is not on the list of B2 waters. I strongly suggest that the Division of Environmental Protection take a look at the data that we have submitted, KCCTU and the Elk River Headwaters Association, and add Old Field Fork to the list of B2 waters in the state.

There are over 492 streams on this list and I want to say that each and every one of those streams are year-round trout waters, but as Mr. Haynes said, there are more streams in the state. So this list need not be exclusive. Let's include other streams that meet the criteria that DEP has determined year-round trout

waters.

I also encourage the Division of Environmental Protection to offer Tier 2.5 protection to the streams on the B2 list. As I said before, industry and trout can live hand in hand in the state of West Virginia. Some of the best trout waters we have in the state of West Virginia now come off the Pocahontas Seam, and those waters in southern West Virginia produce some very good trout.

I've seen places where there have been clear-cut and repairing of buffer zone and the extractive timber industry has kept right on going and the trout stream has thrived. So please keep the definition of year-round trout waters and please understand industry, the extractive industry, and trout can live side by side. I want to thank you for the opportunity to speak tonight.

MS. PRICE: Thank you. Next up, Evan Hansen.

MR. EVAN HANSEN: My name is Evan Hansen and I'm talking on behalf of the West Virginia Rivers Coalition. The West Virginia Rivers

Coalition is a nonprofit organization based in Elkins with about 3,000 members. We wanted to talk about a few aspects of this rule.

I would like to start by talking about the nutrient criteria. I was one of the members of the committee called the Nutrient Criteria Committee that met since 2002 to develop recommendations on new nutrient criteria for West Virginia. I wanted to state that the consensus that the committee reached earlier this year is in my understanding accurately represented in these rules, and we thank DEP for that. And we look forward to DEP backing up those rules through the legislative process and through dealing with the EPA.

I also brought with me an original copy of a letter from Tom Brannon who was the chair of the Nutrient Criteria Committee. And I'm not sure if he sent that by e-mail or not, but that's an original letter that I'm delivering on his behalf.

Essentially he says the same thing, that he chaired the Nutrient Criteria Committee, the consensus of the committee is accurately

represented in the current draft rule. I urge the DEP to preserve the nutrient related language in the current rule and to continue your efforts to ultimately gain approval from the legislature and the US EPA.

And personally I would also like to state that these new rules for nutrients apply to lakes and reservoirs, and that's an important first step, but that leaves the most difficult task yet undone, which is to development criteria for rivers and streams. I would urge the DEP to not lose momentum now that we've made the step to -- whether it's on your own or with the committee or however you choose to do it, to move forward with rivers and streams, because that's what we really need.

I would like to make some comments on the list of trout waters. I would like to commend DEP for listing the additional 337 streams as B2 trout waters and encourage them to uphold those proposed designations, although I do understand as people from Trout Unlimited have so eloquently stated that there are many trout waters that deserve to be on that list that aren't there.

I would say that DEP's decisions for those B2 designations were made in close consultation with the Division of Natural Resources' biologists, especially those of the Coldwater Management Section. And we recognize that DNR is the expert agency with regard to assessment of trout populations in trout streams across the state. We recognize that you've relied on decades of monitoring data at hundreds of sites to make these decisions and we suggest that you maintain that list, unless you expand it.

47CSR2, the rules that we're discussing today, require the protection of existing uses. And existing uses are defined by the Clean Water Act regulation as those uses actually attained in water bodies on or after November 28th, 1975.

So the point I want to make is that this proposed B2 list is correct when it includes waters that have sustained year-round trout populations or trout reproductions that have been documented anytime since November 28th, 1975. That's what the law requires and that seems to be what DEP has done. So we urge you to keep those listings.

Listing these streams based on existing uses is not just required by the Clean Water Act but it also is something of value to the state. We know that in West Virginia numerous trout streams are polluted, but yet if these streams recover the value to the state's economy will be significant.

As one example, the Middle Fork of the Tygart River has a restoration project that has been carried out by the DEP and DNR that have remediated impacts for acid rain and acid mine drainage. And according to the DNR, that's now stocking brown trout, the brown trout are spawning in the upper reaches. Brook trout fisheries are restored throughout numerous tributaries. And according to the DNR 150 miles of Middle Fork trout stream has been rehabilitated for less than $600 per mile each year, far less than the $40,000 each of these miles is thought to provide in economic benefits. So that scenario, just that one scenario alone, provides evidence that designating trout streams based on existing use, again, is not just required but makes good sense.

At times through this process, 47CSR2, as well as the process on the Tier 2.5 list, there have been comments made. Some parties objecting to listing streams for Tier 2.5 protection arguing that those protections are not needed because very stringent water quality criteria are already in place with the B2 list.

I think it's important to recognize that these are two separate lists and two separate kinds of protection that are given. So we encourage DEP in the upcoming months to reiterate that the water quality criteria that we're discussing today and the antidegradation procedures are separate.

The proposed rule removes some site specific exemptions from water quality criteria, in particular on Stoney, Simmons and Beyok (phonetic), and we commend DEP for taking a hard look at those exemptions, and if they expire or if there is no record as to why they should be kept in place for removing them, we think that's the right thing to do.

Finally the proposed rule modifies some of the formulas in Appendix E for five metals, for

cadmium, copper, nickel, silver and zinc. And we would just note that we agree with DEP that those updates reflect the most recent EPA recommendations. Although we do have one nit-picky point on that, which is that the wording and the formulas for dissolved trivalent chromium in sections 8.9.2 and 8.9.3 seem to have not been updated as the others have been, so we suggest you go back and have a look at the wording and formulas in those sections and make those consistent.

Thanks for the opportunity to comment.

MS. PRICE: Next up, Vikki Jo. Actually, Michael Ross, are you still interested in commenting?

MR. MICHAEL ROSS: Yes.

MS. VIKKI JO KENNEDY-SIMS: First off, I just want to state for the record that once again this week, just like last week, there is two hearings that I wanted to be at at the same time, both of them scheduled at 6:00 p.m., quite a distance away in this building, and I'm very upset over that. I wanted that changed last week, this week, so at least this week we could

make both meetings without having to run back and forth. And I was late due to a mechanical breakdown, but that is very important. You need to at least give us an hour. Stagger these meetings. It's impossible for us to be in two. And then tomorrow there's possibly three. So that's very important. Let's just make sure that this don't happen again. There is several of us that want to be in several meetings.

That said, my name is Vikki Jo Kennedy, and I am proud to call West-By-God-Virginia my home for the last three years and nine months.

I just want to look at something, I want make sure I am at the Department of Environmental Protection, right? Okay. Not the Department of Industrial Protection?

So I had quite a bit to say last week on the antidegradation hearing for the water, and I just want to reiterate what I said there, that you have got to keep these waters standards higher, not lower. And in no means can you take any of these streams off, and in no means can you lower the water quality standard.

Water, as one woman so eloquently stated

last week, is going to be the most precious commodity in the state of West Virginia.

Now, you've got to remember that we are a watershed here in West Virginia. And these gracious waters from these mountains and streams go down to the Gulf of Mexico, and on the east side of the state they go over to Chesapeake Bay. So lowering water standards, you're not just going to maybe poison the people and the precious fish from West Virginia, you could be polluting millions of people and millions of streams all the way down. It's the old trickle down effect. So it seems to be effecting us on a regular basis. So let's just keep the water standards high, mostly for the people, secondly for the flora and fauna of West Virginia. And the nutrients, you know, are there for everybody.

And I know for a fact, being a life-long fisherman for pleasure and a commercial fisherman all my life, fish cannot spawn in dirty water. Now, as I sit on the bank of the Kanawha River -- I've only been in Charleston two months and two weeks now, and I watch fish floating belly up

down these rivers.

And I read when I first got here that I could only eat a quarter ounce of fish from the Kanawha River, the Ohio River. And I thought, Oh, my God, why would they even put something that outrageous in a DNR rule book, you could only eat a quarter ounce. You wouldn't want to eat any if you could only eat a quarter ounce. A quarter ounce fish is about that big (indicating). So let's keep them going up, and in no means lower any of these water standards for the people of West Virginia and the rest of the country from the watershed in West Virginia.

And I do appreciate this opportunity to speak to you. Thank you.

MS. PRICE: Michael Ross?

MR. MICHAEL ROSS: Thank you for this opportunity to speak, and I appreciate the comments of my fellow Trout Unlimited members.

I don't have the background or the education that these guys do. I'm a rookie. I've been fishing West Virginia since I was three, hunting since I was nine, backpacking I guess since I was 11.

But I'm really getting my education now, I've worked on a couple of DEP SOS, Save Our Streams projects, a few trout stockings. I'm going to ask a couple of questions.

How can we honestly look at a stream, and if we don't have the information on it, if we don't know that it doesn't produce trout, or any fish for that matter, if we don't have the evidence that it's already non-useable, how can we not list it? What we're doing is we're saying, If we don't see anything, then we can go ahead and do whatever we want.

At a time when the extractive -- at least mineral extractive companies are making their biggest profits, it seems like a small thing to ask that they follow simple regulations, not loosen the regulations. If times were hard for them they'd be asking you to loosen the regulations on them. Now that times are good they're still asking for the same thing.

All I can say is that I love this state, I love our waters, I love our land. I hate to see any of it go before my grand kids are around to see it. I would love to walk out on a stream

some day and say, Your grandpa helped stock this stream. The otters are here because your grandfather came here and fought. I hope I haven't undone anything anybody else has said. Please take that into consideration. Thank you.

MS. PRICE: That's all the folks that marked that they wanted to speak. Are there any other people who now would like to take an opportunity.

MS. LIZ GARLAND: Perhaps it's a reflection of the meeting schedule that I'm sitting in the back of the room saying, Did we say everything we wanted to say, and recognizing that there was a pretty significant hole here.

My name is Liz Garland, I'm with the West Virginia Rivers Coalition. And the significant hole just happens to be a place that I spent all of Sunday, along the North Fork of the Blackwater and on the Blackwater River, so this is a pretty important little piece for me to have an opportunity to share with you.

The Blackwater River has been removed from the B2 trout water list. The current water quality standards classify the entire length of

the Blackwater River as a B2 trout water. And West Virginia DEP is proposing to replace this with a list for the Blackwater River from the mouth of the North Fork upstream.

If approved the entire length of the Blackwater River below the confluence of the North Fork would be removed from the B2 list. In explaining this change in DEP's briefing document it says, in Section 7.2.d.9, The Blackwater River is referred to as a trout stream, which is repetitive since it is listed on the trout list in Appendix A. Therefore Section 7.2.d.9 has been amended. This statement is false. The proposed change is not simply removal of repetitive reference, it is actually a delisting of several miles of the Blackwater River.

According to the Clean Water Act, DEP cannot remove uses without performing a Use Attainability Analysis. DEP has given no indication that a UAA has been performed for the Blackwater, so we must ask DEP to keep the entire Blackwater River list on the B2 until such time that a UAA is complete. We do recognize it as a trout water.

Thank you very much.

MS. PRICE: Anyone else?

MR. PHILIP SMITH: I'm Philip Smith, I just wanted to make one more thing on the B2 listing for the definition change. I think it's important that we also -- I just want to reiterate that it's important we maintain that definition.

For one thing, and that's another point that really wasn't touched on, is ecological impact for maintaining genetic flow on the secondary watersheds, like one speaker noted, that there's a lot of streams that provide young-of-the-year that are the tributaries but aren't going to be considered B2 if they were amended to only include reproducing only streams. Because there are several trout streams that have year-round populations of wild fish that come from these tributaries, and it's important that the water protection -- that the protection of the habitat maintain it's highest standards as a B2 level so that we can maintain that genetic flow between these tributary populations. That's really all I really wanted to reiterate on that.

Thank you.

MS. PRICE: Anyone else?

This completes our official comment period. We will file our rule with our responses to your comments on or before July 28th with the Secretary of State's office.

Please sign up to be on our public notice mailing list. You will receive information from us on-line or by U.S. mail, whichever you choose. We have some cards in the back and you can take those and you can sign up on-line or you can call us and we will set you up.

Thanks again for your interest and your participation. Drive home safely.

(This hearing concluded at 6:45 p.m.)

STATE OF WEST VIRGINIA,

COUNTY OF KANAWHA, to-wit:

I, James D. Nielsen, Court Reporter and a notary public within and for the county and state aforesaid, duly commissioned and qualified, do hereby certify that the foregoing public hearing of the West Virginia Department of Environmental Protection was duly taken by and before me at the time and place specified in the caption hereof.

I do further certify that the said hearing was correctly taken by me in stenotype notes, that the same were accurately written out in full and reduced to typewriting; and that said deposition is a true record of the hearing.

I do further certify that I am neither attorney or counsel for, not related to or employed by, any of the parties to the action in which this hearing is taken, and further that I am not a relative or employee of any attorney or counsel employed by the parties hereto or financially interested in this action.

My commission expires May 15, 2016.

Given under my hand this 19th day of July, 2006.

James D. Nielsen
Court Reporter/Notary Public

OFFICIAL SEAL
NOTARY PUBLIC
STATE OF WEST VIRGINIA
JAMES D. NIELSEN
RR5 Box 304-D
Charleston, WV 25312
My Commission Expires May 15, 2016

REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

West Virginia Department of Environmental Protection, Division of Water and Waste Management
July 17, 2006

Do you wish to speak?	NAME	ADDRESS	PHONE	Check here if you are also commenting at the Recycling Hearing.
	JACK WILLIAMS	5225 NESTING WAY 25313	776-2566	
YES (1)	ERNIE NESTER	P.O. BOX 235, ALLOY, WV 25002	304-779-2706	
NO	JOE CROWDER	HC-70, BOX 53, ELKVIEW WV. 25071	304-965-1338	
YES (2)	Ed Hayne	652 Gordon Dr. Chas. WV 25314	304 345-6500	
	Robert Symons	718 Helen Ave Chas WV	304-345-6801	
NO	Andrew McCallister	PO BOX 273 Charleston 25321-0273	304-340-3850	
YES (3)	LARRY ORR	104 HILLCREST AVE ELKVIEW 25071	304 9657185	
NO	ED CROSS	180 ORCHARD. FRAZIER'S BTM WV 25082	304 937-2214	
NO	Jeff Shafer	5316 Melwood Dr. Cross Lanes WV	304-776-0009	
NO	MAX ROBERTSON	916 Echo Rd, So Chas WV 25303	41-744-9338	
NO	DARRELL MORRIS	860 Whispering Way S. Chas. WV 25303	744-1916	
YES (4)	Charlie Nichols	4706 West Washington St. Cross Lanes WV	776-4403	
	DAVE FULTON	409 DODGE AVE WILLIAMSTOWN WV	304 483 0017	
NO	Chris Shockey	2307 Mt. Vernon Circle Parkersburg WV 26101	422-1375	
NO	Sammy Gray	1600 Pennsylvania Ave Chas WV 25302	340-2005	
NO	Ken McDaniel	421 Woodbridge Drive 25311	342-1017	

REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

West Virginia Department of Environmental Protection, Division of Water and Waste Management
July 17, 2006

	Do you wish to speak?	NAME	ADDRESS	PHONE	Check here if you are also commenting at the Recycling Hearing.
	NO	Jennie Henthorn	PO Box 1386, Charleston WV 25306	304-347-1162	
	NO	Judy Parker	PO Box 1791 Chas, WV 25326	720-6752	
(5)	Yes	Evan Hansen	219 Wall St Morgantown 26505	292-2450	
(7)	~~Yes~~	Michael Ross	2208 Donald Ave, Hunt 25701	522-8221	
(8)	NO	Liz Garland	801 N Randolph Ave Elkins 26241	637 7201	
	NO				

REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

West Virginia Department of Environmental Protection, Division of Water and Waste Management
July 17, 2006

	Do you wish to speak?	NAME	ADDRESS	PHONE	Check here if you are also commenting at the Recycling Hearing.
(9)	✓	Philip Smith	1967 Grapevine Road Sissonville WV 25320	988 1158	
(10)	X	Vikki Jo (Kennedy)	PO Box 5153 Chs. 25361	444 3370 Cell	X

Brooks Run
MINING COMPANY, LLC

208 Business Street Beckley WV 25802
Ph. 304-256-1015 / Fax 304-256-0430

July 17, 2006

Ms. Lisa McClung, Director
West Virginia Department of Environmental Protection
Division of Water and Waste Management
601 57th Street
Charleston, West Virginia 25301

RE: Trout Stream Listing Objection
Jacobs Fork (BST-70-W)

Brooks Run Mining Company (BRM) appreciates the opportunity to provide comments on the draft Requirements Governing Water Quality Standards (47 CSR 2) (WQS) put forth by the West Virginia Department of Environmental Protection (WVDEP) which are currently out for public review and comment. BRM is the leaseholder of property along Jacobs Fork (BST-70-W) in McDowell County, West Virginia. This letter is being submitted to provide additional or supplemental information regarding the listing of Jacobs Fork (BST-70-W) in Appendix A of the WQS Trout Waters and to formally object to the listing.

Recently, BRM contracted Potesta & Associates, Inc. (POTESTA) to conduct a stream investigation and evaluation of Jacob's Fork due to the streams inclusion on the WVDEP proposed Tier 2.5 Anti-degradation protective status list. The survey, which is enclosed, documented various anthropogenic activities and subsequent disturbances in the watershed. No salmonid species of any type were collected at the three stations sampled in Jacob's Fork and none were expected based on the existing stream conditions.

BRM has reviewed the data provided by the West Virginia Division of Natural Resources (WVDNR) which were utilized by the WVDNR and WVDEP in the determination that Jacobs Fork supports a year-round trout population and should be designated as a Trout Water. BRM believes that this information is insufficient to warrant the streams listing. Specifically, there were three fish surveys conducted in this reach between 1983 and 1985. The 20 year-old data indicate a warm water fish community with several types of suckers, dace, chubs, darters, stonerollers, and sunfish. While two non-native salmonids, the rainbow trout and the brown trout, were found in the stream, no native brook trout were found during these surveys. Although in one sampling event, young-of-the-year individuals were said to be found. The

surveys were conducted to evaluate a stocking program and clearly documented the presence of stocked fish. Only once were size classes found that represented anything but stocked fish. The WVDNR website does not indicate the stream still receives trout stockings and trout are not found in the stream currently.

With the absence of temperature data indicating that Jacob's Fork could support coldwater species, and the absence of coldwater species in these waters when they are not continuously stocked, there appears to be no support for inclusion of Jacob's Fork on the Trout Stream List in Appendix A.

As no data exist to support the inclusion of Jacobs Fork in Appendix A of 47-CSR-2, BRM respectfully requests that you remove Jacobs Fork from the draft Trout Stream list.

Thank you for your consideration in this matter.

Sincerely,

Mindy Amstead for Russ Lambert

Russ Lambert
Environmental Compliance Engineer

RL:MYA/ljk

Enclosure

STREAM INVESTIGATION AND EVALUATION

Jacob's Fork (WVDNR Code WVBST-70-W*) McDowell County, West Virginia*

Prepared for:

Brooks Run Mining Company
208 Business Street
Beckley, West Virginia 25802

Prepared by:

Potesta & Associates, Inc.
7012 MacCorkle Avenue, S.E.
Charleston, West Virginia 25304
Phone: (304) 342-1400 Fax: (304) 343-9031
E-Mail: potesta@potesta.com

Project 0101-05-0635

December 2005

POTESTA

TABLE OF CONTENTS

APPENDICES

STREAM INVESTIGATION AND EVALUATION

Jacob's Fork
(WVDNR Code WVBST-70-W*)*
McDowell County, West Virginia

1.0 INTRODUCTION

Potesta & Associates, Inc. (POTESTA) has been retained by Brooks Run Mining Company (BRM) to conduct a stream investigation and evaluation of Jacob's Fork regarding its proposed listing on the West Virginia Department of Environmental Protection (WVDEP) proposed Tier 2.5 Anti-degradation protective status list. The West Virginia Department of Natural Resources (WVDNR) stream code is WVBST-70-W.

Jacob's Fork is a tributary of Dry Fork of the Tug Fork of the Big Sandy River. The stream is depicted on a topographic map provided as Appendix A.

Jacob's Fork is listed on the presumptive Tier 2.5 list as a trout stream. In order to meet this designation, the stream must have a documented naturally reproducing trout population. POTESTA's evaluation was conducted to determine whether a naturally reproducing trout population exists in Jacob's Fork.

2.0 METHODS

Habitat evaluations were conducted utilizing the United States Environmental Protection Agency's (EPA) "Rapid Bioassessment Protocol for Use in Wadeable Streams and Rivers" (RBP Protocol).

POTESTA performed fish surveys utilizing a combination of EPA's Environmental Monitoring and Assessment Program (EMAP) Field Operation and Methods for Measuring the Ecological Condition of Wadeable Streams (EPA, 1998) and the West Virginia Division of Natural Resources (WVDNR) Scientific Collecting Permit Standard Conditions for Environmental Assessments (WVDNR, 2000). Fish sampling was conducted using a backpack electro-fishing unit and started at the downstream limit of the station and proceeded in an upstream direction, which characterized one pass. Two complete passes were performed throughout each station. Fish were placed into holding tubs or buckets until the pass was completed and then taken to a suitable area (i.e., the stream bank) for processing. Fish were identified to the lowest practical taxonomic level, weighed and measured, external anomalies noted, and then released after the final pass was complete. No specimens were retained and preserved. Taxonomic identification was performed by an ichthyologist familiar with the taxonomy of the fish species found in the study area.

Water quality samples were collected at each station and submitted to a state certified laboratory for analyses of: fecal coliform, total iron, total aluminum, and total manganese.

Additionally, basic field water chemistry measurements were recorded. Field measurements consisted of the following:

- pH
- temperature
- conductivity
- dissolved oxygen
- turbidity

3.0 DESCRIPTION OF STREAM INVESTIGATION & EVALUATION

POTESTA established sampling stations at three locations on Jacob's Fork. All three stations were sampled in a perennial reach of the stream. Stream assessments were conducted at each location.

Table 1 presents the scores assessed to select criterion for the three stations located on Jacob's Fork.

The first assessment was completed just upstream of the mouth of Jacob's Fork, 1,200 meters upstream of the confluence with Dry Fork (Photos 1 and 2). This station was located between Route 16 and an existing rail line downstream of one active coal tipple and one small coal mining facility. Heavy beaver activity downstream prevented establishing this station at the actual mouth of Jacob's Fork. This station is located downstream of several towns and therefore is affected by moderate human influence.

The second stream assessment station was conducted on Jacob's Fork at the town of Squire (Photos 3 and 4). This station was located between Route 16 and an existing rail line within the town of Squire; therefore, a moderate/high human influence is expected.

The third stream assessment station was conducted on Jacob's Fork downstream of the town of Bishop (Photos 5 & 6). This station was located between Rt. 16 and an existing rail line downstream of a road crossing. Human influence was evident at the station as well as beaver activity downstream.

TABLE 1
Stream Assessment Criteria

Station	Date	Cover	Channel Alteration	Sediment Deposition	Bank Protection	Vegetative Station	Total RPB Score
Jacob's Fork – Upstream of Mouth	11/30/05	13	16	14	17	13	153
Jacob's Fork at Squire	12/02/05	14	15	14	16	18	152
Jacob's Fork – Downstream of Bishop	12/02/05	13	15	14	14	12	130

4.0 FISH SURVEY RESULTS

No salmonid species of any type were collected at the three stations sampled in Jacob's Fork. The fish community upstream of the mouth of Jacob's Fork was comprised of 596 individuals representing 16 primarily warm water species. The central stoneroller (*Campostoma anomalum*) was the most abundant species at this station. The fish community in Jacob's Fork at the town of Squire was comprised of 1,090 individuals representing 17 primarily warm water species. The blacknose dace (*Rhinichthys atratulus*) was the most abundant species at this station. The fish community in Jacob's Fork downstream of the town of Bishop was comprised of 695 individuals representing 9 primarily warm water species. The blacknose dace (*Rhinichthys atratulus*) was the most abundant species at this station.

Table 2 presents the fish survey results collected at three stations in Jacob's Fork.

TABLE 2
Fish Species Collected at Three Stations in Jacob's Fork

Genus	Species	Number of Fish Collected		
		Jacob's Fork – Upstream of Mouth	**Jacob's Fork at Squire**	**Jacob's Fork - Downstream of Bishop**
Ambloplites	*rupestris*		4	2
Campostoma	*anomalum*	144	229	115
Catostomus	*commersoni*	4	2	56
Cottus	*bairdi*	105	83	134
Cyprinella	*spiloptera*	2	5	
Etheostoma	*blennioides*	31	8	
Etheostoma	*caeruleum*	55	112	94
Etheostoma	*flabellare*	4		
Etheostoma	*nigrum*	14		
Etheostoma	*zonale*	15	4	
Hypentelium	*nigricans*	84	74	
Luxilus	*chrysocephalus*	5	5	43
Micropterus	*dolomieui*	1	2	
Moxostoma	*erythrurum*		2	1
Notropis	*ludibundus/volucellus*		62	
Notropis	*rubellus*		2	
Notropis	*sp.*	29		
Pimephales	*notatus*	6	26	
Rhynichthys	*atratulus*	94	381	248
Semotilus	*atromaculatus*	3	89	2

5.0 WATER SAMPLE ANALYSIS RESULTS

POTESTA collected water samples at three stations in Jacob's Fork on November 30 and December 2, 2005. Samples were analyzed by a state certified laboratory. An exceedance of the fecal coliform limit of 800 colonies/mL was observed at Jacob's Fork at Squire and Jacob's Fork downstream of Bishop stations. No other water quality violations were observed.

Table 3 presents the results of the water sample analysis for three stations in Jacob's Fork.

TABLE 3
Water Sample Analysis Results Collected at Three Stations in Jacob's Fork

Station	Aluminum (mg/L)	Iron (mg/L)	Manganese (mg/L)	Fecal Coliform (col/100mL)
Jacob's Fork – Upstream of Mouth	0.070	0.206	0.028	550
Jacob's Fork at Squire	0.065	0.121	0.010	2100
Jacob's Fork – Downstream of Bishop	0.080	0.031	0.006	1200

6.0 FIELD WATER CHEMISTRY RESULTS

POTESTA measured basic water chemistry at the three Jacob's Fork assessment stations on November 30 and December 2, 2005. The field readings were taken from field monitoring equipment calibrated by POTESTA. No field water chemistry values exceeded acceptable ranges.

Table 6 presents the water chemistry field readings.

TABLE 6
Water Chemistry Field Readings

Station	pH (SU)	Temperature (^{0}C)	Conductivity (uS)	Dissolved Oxygen (mg/l)	Turbidity (SU)
Jacob's Fork – Upstream of Mouth	7.90	7.8	571	11.87	7.9
Jacob's Fork at Squire	8.12	3.3	508	13.45	2.0
Jacob's Fork - Downstream of Bishop	8.31	6.4	461	12.05	2.5

7.0 DISCUSSION

Two point source discharges were identified in the Jacob's Fork watershed; both were small coal mining facilities. Several non-point source discharges were also identified in the watershed. Jacob's Fork flows through six small towns and can be expected to be affected by a moderate/high amount of human influence. A two lane asphalt road (Route 16) and a railroad line run the length of Jacob's Fork as well.

Habitat at the three stream assessment stations in Jacob's Fork was not indicative of brook trout stream habitat. Jacob's Fork is characterized by a flat riffle/run type of habitat and not the high gradient riffle/pool complex that brook trout prefer. Also, the overall open canopy in Jacob's Fork would not provide the shading required for trout stream temperature regulation.

No salmonid species of any type were collected at the three stations sampled in Jacob's Fork and none were expected based on the stream habitat. Two Jacob's Fork stations, one at the town of Squire and the other upstream of the mouth, exhibited good diversity and abundance indicative of a moderately healthy warm water stream. Jacob's Fork downstream of Bishop lacked good diversity but had an acceptable abundance. Beaver activity below this station has changed the habitat into a long run with little riffle and pool habitat.

High fecal coliform concentrations at Jacob's Fork at Squire and Jacob's Fork downstream of Bishop indicate the influence of human activities in the watershed.

8.0 CONCLUSION

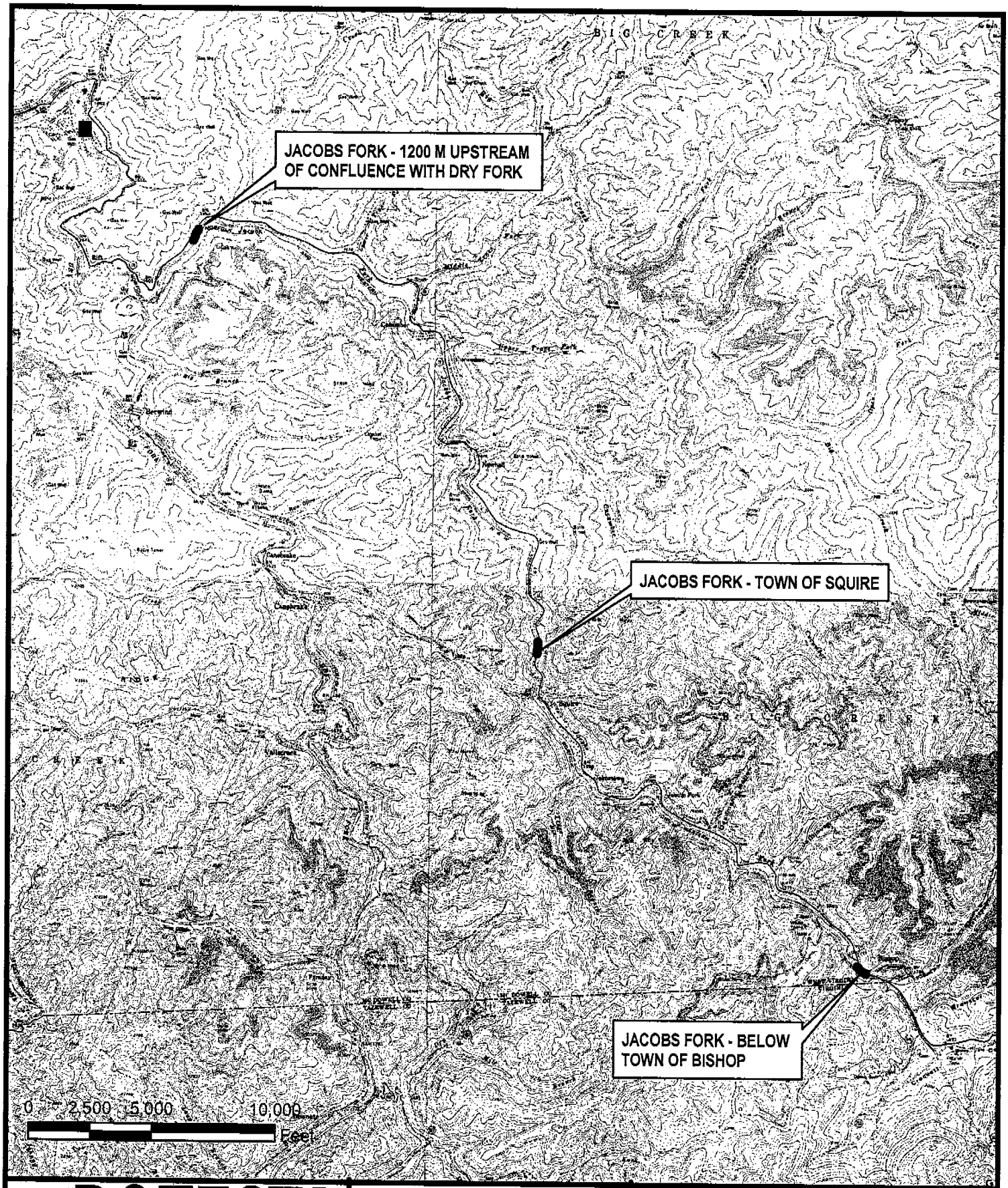
Various anthropogenic activities and subsequent disturbances in the watershed were documented in the Jacob's Fork watershed. Although total habitat scores from the three stream assessment stations did not indicate impairment, the habitat in Jacob's Fork is not suitable for brook trout populations. No salmonid species of any type were collected at the three stations sampled in Jacob's Fork and none were expected based on the stream habitat. Jacob's Fork, overall, supports a moderately healthy warm water fish population but would not be expected to support a naturally reproducing trout population.

With the information presented in this document regarding Jacob's Fork and its proposed listing on the proposed Tier 2.5 Anti-degradation protective status list, it does not appear this stream meets the necessary criteria to be listed as a trout stream.

9.0 CLOSING

This report was prepared to assist BRM in evaluating and planning with respect to the subject site. The scope of this study was mutually devised by POTESTA and BRM and is limited to the specific project, location, and time period described herein. The work scope and report represent POTESTA's understanding of site conditions as discernible from information provided by others and obtained by POTESTA using the methods specified. POTESTA assumes no responsibility for information provided or developed by others or for documenting conditions detectable with methods or techniques not specified in the work scope. In addition, no activity, including sampling, assessment or evaluation of any material or substance, may be assumed to be included in this study unless specifically considered in the scope of work and this report. Sketches and maps in this report are included only to aid the reader and should not be considered surveys or engineering studies. If

additional data concerning this site becomes available, POTESTA should be informed so that we may examine the information and, if necessary, modify this report accordingly.



POTESTA
ENGINEERS AND ENVIRONMENTAL CONSULTANTS

SCALE	1" = 5000'
DATE	DECEMBER 2005
PROJECT NO.	05-0635
DRAWN	JWM
AV FILE NO.	C:\GIS\Projects\0101-05-0635 Jacobs Fork Electrofishing\JACOBS FORK SURVEY SECTIONS.mxd

Title

JACOBS FORK STREAM ASSESSMENT ZONES
BROOKS RUN MINING
208 BUSINESS STREET
BECKLEY, WEST VIRGINIA 25802

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET (FRONT)

STREAM NAME Jacob's Fork	LOCATION ~1200 m above confluence w/ Dry Fork
STATION # 1 RIVERMILE ____	STREAM CLASS
LAT 37° 17.341 N LONG 081° 39.496 W	RIVER BASIN Tug Fork
STORET #	AGENCY
INVESTIGATORS JG / JH / WM / CS / JPW	
FORM COMPLETED BY CS / JH	DATE 11/30/05 TIME 1300 AM (PM) — REASON FOR SURVEY Trout Survey

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☒
☐	showers (intermittent)	☐
___% ☐	%cloud cover	☐ ___%
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature 43 °C

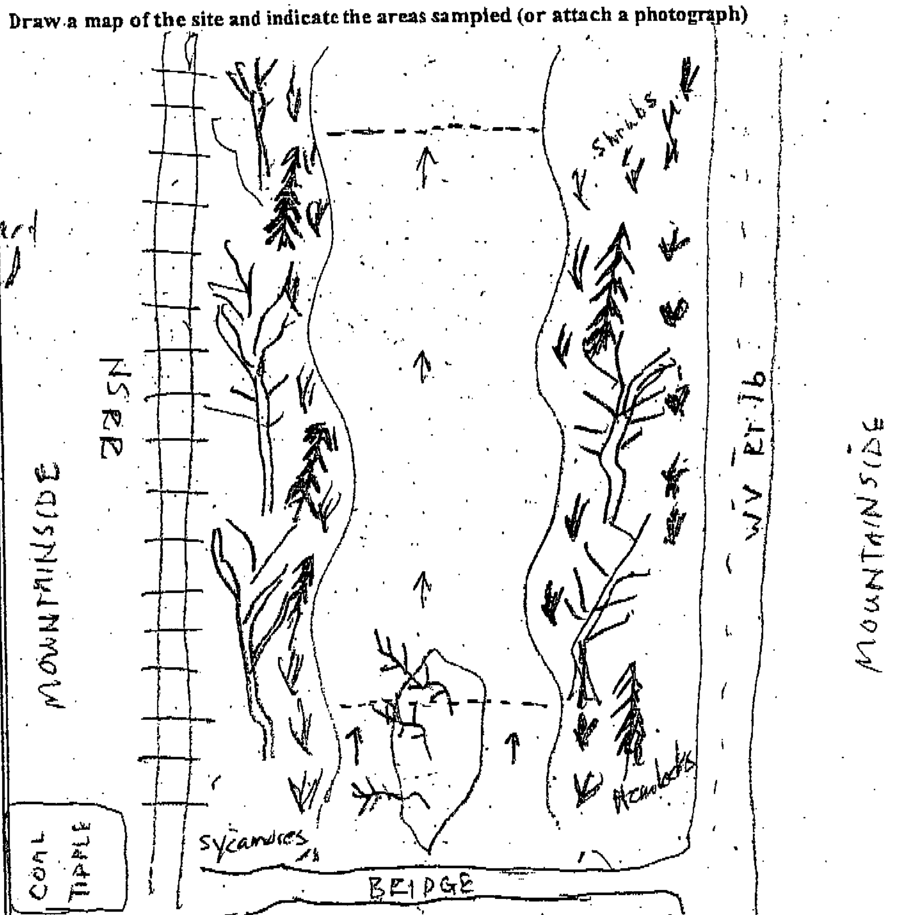
Other ____________

SITE LOCATION/MAP

CAM# B

Photo# 1 - US Start
2 - DS End

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☒ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☒ Mixture of origins
☐ Other________

Catchment Area ___-___ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIEL ATA SHEET
(BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☐ Residential

Local Watershed N
☐ No evidence ☒ S
☐ Obvious sources

Local Watershed E
☐ None ☐ Moder

ollution
potential sources

on
☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☒ Grasses ☐

dominant species present Sycamore Hemlock

paceous

INSTREAM FEATURES

Estimated Reach Length 150 m
Estimated Stream Width 12 m
Sampling Reach Area _____ m²
Area in km² (m²/1000) _____ km²
Estimated Stream Depth _____ m
Surface Velocity (at thalweg) _____ m/sec

Canopy Cover
☒ Partly open ☐ F

shaded ☐ Shaded

High Water Mark 2 m

Proportion of Reac
Morphology Types
☐ Riffle 40 %
☐ Pool 5 %

presented by Stream
Run 15 %

Channelized ☐ yes ☒ No
Dam Present ☐ ye ☐ No

LARGE WOODY DEBRIS

LWD 2 m²
Density of LWD _____ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted flo ☐ Free floating
☐ Floating Algae ☒ Attached Algae

dominant species present _____

Portion of the reach with aquatic vegetation 10 %

WATER QUALITY

Temperature 7.8 °C
Specific Conductance 571 µ
Dissolved Oxygen 11.87 mg/L
pH 7.90
Turbidity 7.9 NTU
WQ Instrument Used _____

Water Odors
☒ Normal/None
☐ Petroleum
☐ Fishy

ewage
hemical
ther_____

Water Surface Oils
☐ Slick ☐ Sheen
☒ None ☐ Other_

Globs ☐ Flecks

Turbidity (if not m
☐ Clear ☒ Slightl
☐ Opaque ☐ Stainec

ed)
id ☐ Turbid
☐ Other_____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other_____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdu
☐ Relict shells

☐ Paper fiber ☒ Sand
Other fine silt & sand slurry

Looking at stones w
embedded, are the
☒ Yes ☐ No

are not deeply
rsides black in color?

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE (does not necessarily a		MPONENTS to 100%)
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	10			
Cobble	64-256 mm (2.5"-10")	75	Muck-Mud	black, very fine organic (FPOM)	2-5
Gravel	2-64 mm (0.1"-2.5")	5			
Sand	0.06-2mm (gritty)	5	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Jacob's Fork	LOCATION ~1200 M above confluence w/ Dry Fk
STATION # 1 RIVERMILE	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN Tug Fork
STORET #	AGENCY
INVESTIGATORS JG/CS/JH/JW/WM	
FORM COMPLETED BY CS/JH	DATE 11/30/05 TIME 1300 AM (PM)
REASON FOR SURVEY Front Survey	

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 13	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 17	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization ma extensive; embanki or shoring structur present on both ba and 40 to 80% of s reach channelized a disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 16	20 19 18 17 (16)	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle o bend; bottom cont provide some habit distance between ri divided by the wid the stream is betwe to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 17	20 19 18 (17) 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstabi 60% of bank in rea areas of erosion; hi erosion potential d floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 9 (LB)	Left Bank 10 (9)	8 7 6	5 4	3 2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4	3 2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfac covered by vegetat disruption obvious patches of bare soi closely cropped vegetation commo than one-half of th potential plant stub height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 7 (LB)	Left Bank 10 9	8 (7) 6	5 4	3 2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 (7) (6)	5 4	3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian z 6-12 meters; huma activities have imp zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 10 (LB)	Left Bank 10 9	8 7 6	5 4	3 2 1 0
SCORE 5 (RB)	Right Bank 10 9	8 7 6	(5) 4	3 2 1 0

Total Score 153

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Jacobs Fk	LOCATION ~1200m US mouth		
STATION # _____ RIVERMILE _____	STREAM CLASS		
LAT _____ LONG _____	RIVER BASIN Tug Fork		
STORET #	AGENCY		
INVESTIGATORS TG/JH/CS/WM/JW		LOT NUMBER	
FORM COMPLETED BY Gene	DATE 4/30/05 TIME 12:20 AM PM	REASON FOR SURVEY Trout Survey	

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☑ Cobble 75 % ☑ Snags 5 % ☑ Vegetated Banks 75 % ☑ Sand 5 % ☐ Submerged Macrophytes ____ % ☐ Other ( ) ____ %
SAMPLE COLLECTION	**Gear used** ☐ D-frame ☑ kick-net ☐ Other _____ **How were the samples collected?** ☑ wading ☐ from bank ☐ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble ____ ☐ Snags ____ ☐ Vegetated Banks ____ ☐ Sand ____ ☐ Submerged Macrophytes ____ ☐ Other ( ) ____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	(1)	2	3	4	Macroinvertebrates	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	2	(3)	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	(2)	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	(1)	2	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	(1)	2	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	(1)	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	(1)	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	(1)	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)

STREAM NAME Jacob's Fork	LOCATION JF2 Jacobs Fork at Squire
STATION # JF2 RIVERMILE	STREAM CLASS
LAT 37°14.713 N LONG 081°36.619 W	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS JG / JH / WM / CS / JPW	
FORM COMPLETED BY JH / CS	DATE 12/2/05 TIME 0860 (AM) PM
	REASON FOR SURVEY Trout Survey

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
___% ☐	%cloud cover	☐ ___%
☒	clear/sunny	☒

Has there been a heavy rain in the last 7 days? ☒ Yes ☐ No

Air Temperature 30 °F

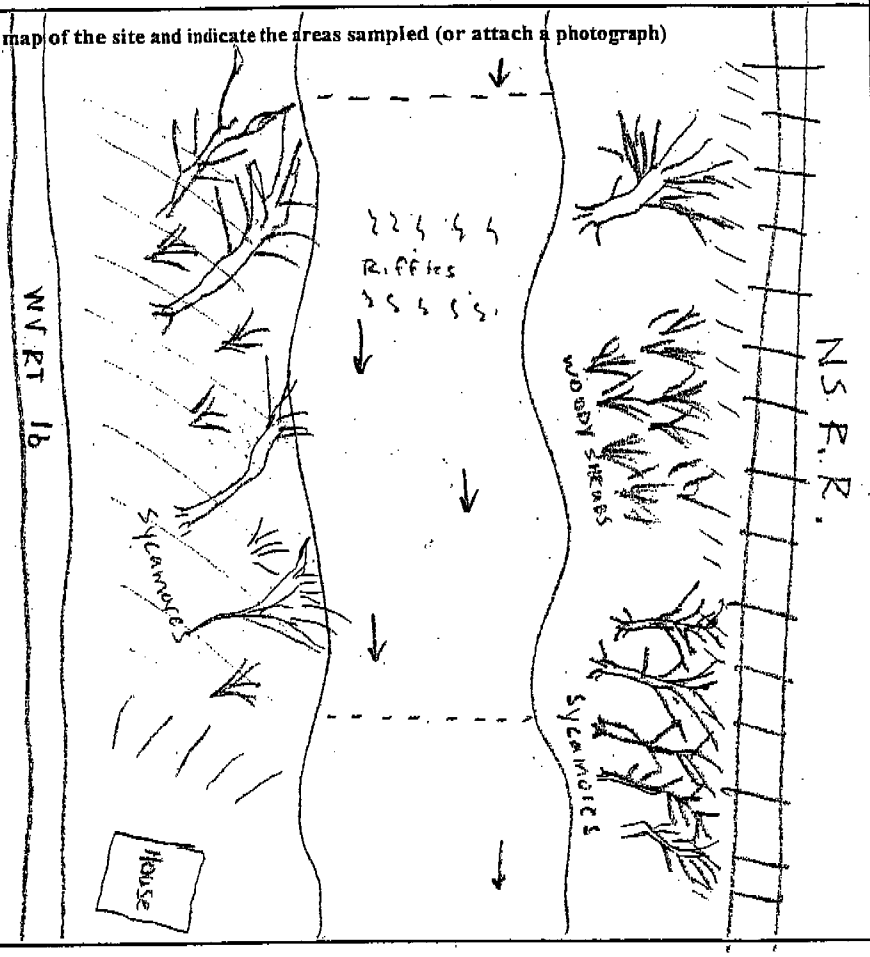
Other_____

SITE LOCATION/MAP

CAM B

Photo #7 - US start
#8 - DS end

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Origin
☐ Glacial ☐ Spring-fed
☐ Non-glacial montane ☒ Mixture of origins
☐ Swamp and bog ☐ Other_____

Stream Type
☐ Coldwater ☒ Warmwater

Catchment Area_____km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIEL ATA SHEET
(BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
☒ Forest ☐ Commercial
☐ Field/Pasture ☐ Industrial
☐ Agricultural ☐ Other _____
☐ Residential

Local Watershed
☐ No evidence ☒
☐ Obvious sources

Local Watershed E
☐ None ☒ Moder

olution
potential sources

on
☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
☒ Trees ☒ Shrubs ☐ Grasses ☐

dominant species present Sycamore

baceous

INSTREAM FEATURES

Estimated Reach Length 150 m
Estimated Stream Width 11 m
Sampling Reach Area _____ m²
Area in km² (m²/1000) _____ km²
Estimated Stream Depth _____ m
Surface Velocity (at thalweg) _____ m/sec

Canopy Cover
☒ Partly open ☐ H

shaded ☐ Shaded

High Water Mark 3 m

Proportion of Reac
Morphology Types
☐ Riffle 60 %
☐ Pool 15 %

presented by Stream
Run 25 %

Channelized ☐ Y
☒ No

Dam Present ☐ Y
☒ No

LARGE WOODY DEBRIS

LWD 1 m²
Density of LWD _____ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
☐ Rooted emergent ☐ Rooted submergent ☐ Rooted flc
☐ Floating Algae ☒ Attached Algae

☐ Free floating

dominant species present _____

Portion of the reach with aquatic vegetation 20 %

WATER QUALITY

Temperature 3.3 °C
Specific Conductance 508 µs
Dissolved Oxygen 13.45 mg/L
pH 8.12
Turbidity 2.0 NTU
WQ Instrument Used _____

Water Odors
☒ Normal/None
☐ Petroleum
☐ Fishy

ewage
Chemical
Other _____

Water Surface Oils
☐ Slick ☐ Sheen
☒ None ☐ Other_

Globs ☐ Flecks

Turbidity (if not me
☐ Clear ☐ Slightl
☐ Opaque ☐ Stained

ed)
id ☐ Turbid
☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
☒ Normal ☐ Sewage ☐ Petroleum
☐ Chemical ☐ Anaerobic ☐ None
☐ Other _____

Oils
☒ Absent ☐ Slight ☐ Moderate ☐ Profuse

Deposits
☐ Sludge ☐ Sawdu
☐ Relict shells

☐ Paper fiber ☒ Sand
Other Silt

Looking at stones w
embedded, are the
☐ Yes ☒ No

are not deeply
rsides black in color?

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock			Detritus	sticks, wood, coarse plant materials (CPOM)	30
Boulder	> 256 mm (10")	1			
Cobble	64-256 mm (2.5"-10")	80	Muck-Mud	black, very fine organic (FPOM)	10
Gravel	2-64 mm (0.1"-2.5")	5			
Sand	0.06-2mm (gritty)	4	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)				

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Jacobs Fork	LOCATION Ft Squire	
STATION # JF2 RIVERMILE	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS JG/CS/JH/JW/LM		
FORM COMPLETED BY JH/CS	DATE 12/2/05 TIME 8:50 AM PM	REASON FOR SURVEY Trout Survey

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization ma extensive; embank or shoring structur present on both ba and 40 to 80% of s reach channelized disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle o bend; bottom conto provide some habit distance between ri divided by the wid the stream is betwe to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 13	20 19 18 17 16	15 14 13 12 11	10 9 8 7	6 5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstab 60% of bank in rea areas of erosion; h erosion potential d floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 8 (LB)	Left Bank 10	9 8	7 6	5 4 3 2 1 0
SCORE 9 (RB)	Right Bank 10	9 8	7 6	5 4 3 2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfac covered by vegetat disruption obvious patches of bare soi closely cropped vegetation commo than one-half of th potential plant stub height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 9 (LB)	Left Bank 10	9 8	7 6	5 4 3 2 1 0
SCORE 9 (RB)	Right Bank 10	9 8	7 6	5 4 3 2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian z 6-12 meters; huma activities have imp zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 9 (LB)	Left Bank 10	9 8	7 6	5 4 3 2 1 0
SCORE 7 (RB)	Right Bank 10	9 8	7 6	5 4 3 2 1 0

Total Score 152

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Jacobs Fork	LOCATION @ Squirrel	
STATION # JF-2 RIVERMILE_____	STREAM CLASS	
LAT _____ LONG _____	RIVER BASIN	
STORET #	AGENCY	
INVESTIGATORS JG/CS/TH/JW/WM		LOT NUMBER
FORM COMPLETED BY JH/CS	DATE 12/2/05 TIME ~~10:50~~ (AM) PM	REASON FOR SURVEY Trout Survey

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐ Cobble 90 % ☐ Snags 10 % ☐ Vegetated Banks 90 % ☐ Sand 5 % ☐ Submerged Macrophytes_____% ☐ Other (_____)_____%
SAMPLE COLLECTION	**Gear used** ☐ D-frame ☒ kick-net ☐ Other _____ **How were the samples collected?** ☒ wading ☐ from bank ☐ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble_____ ☐ Snags_____ ☐ Vegetated Banks_____ ☐ Sand_____ ☐ Submerged Macrophytes_____ ☐ Other (_____)_____
GENERAL COMMENTS	

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	(1)	2	3	4	Slimes	(0)	1	2	3	4
Filamentous Algae	(0)	1	2	3	4	Macroinvertebrates	0	1	2	(3)	4
Macrophytes	(0)	1	2	3	4	Fish	0	1	2	(3)	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	0	1	2	3	4	Anisoptera	0	1	(2)	3	4	Chironomidae	0	1	(2)	3	4
Hydrozoa	0	1	2	3	4	Zygoptera	0	1	(2)	3	4	Ephemeroptera	0	1	(2)	3	4
Platyhelminthes	0	1	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	(2)	3	4
Turbellaria	0	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	1	2	3	4	Sialidae	0	1	(2)	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	(2)	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	3	4						
Decapoda	0	1	(2)	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	1	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	0	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(FRONT)

Below Bishop

STREAM NAME Jacobs Fork @ trail	LOCATION
STATION # JF-5 RIVERMILE_____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN
STORET #	AGENCY Potesta
INVESTIGATORS JH/CS/JG/WM/JPW	
FORM COMPLETED BY JLH/JG	DATE 12/2/05 TIME 1400 AM (PM)
	REASON FOR SURVEY Tier 2.5 classification

WEATHER CONDITIONS

Now		Past 24 hours
☐	storm (heavy rain)	☐
☐	rain (steady rain)	☐
☐	showers (intermittent)	☐
____% ☐	%cloud cover	☒ 50 %
☒	clear/sunny	☐

Has there been a heavy rain in the last 7 days? ☐ Yes ☒ No

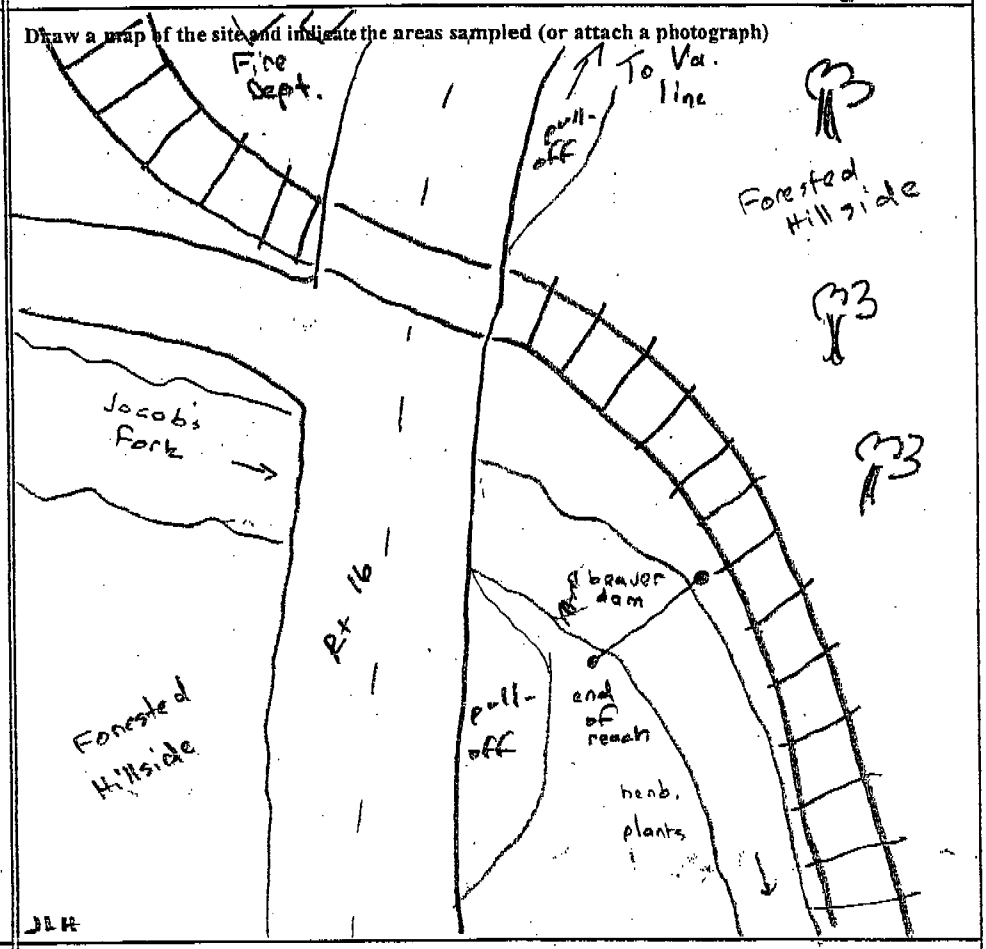
Air Temperature____ °C

Other_____

* snowed 1/2" last night

SITE LOCATION/MAP

Draw a map of the site and indicate the areas sampled (or attach a photograph)



STREAM CHARACTERIZATION

Stream Subsystem
☒ Perennial ☐ Intermittent ☐ Tidal

Stream Type
☐ Coldwater ☑ Warmwater

Stream Origin
☐ Glacial
☐ Non-glacial montane
☐ Swamp and bog
☐ Spring-fed
☒ Mixture of origins
☐ Other_____

Catchment Area_____ km²

PHYSICAL CHARACTERIZATION/WATER QUALITY FIELD DATA SHEET
(BACK)

WATERSHED FEATURES

Predominant Surrounding Landuse
- ☑ Forest
- ☐ Field/Pasture
- ☐ Agricultural
- ☐ Residential
- ☐ Commercial
- ☐ Industrial
- ☐ Other _____

Local Watershed NPS Pollution
- ☐ No evidence
- ☐ Some potential sources
- ☑ Obvious sources

Local Watershed Erosion
- ☐ None
- ☑ Moderate
- ☐ Heavy

RIPARIAN VEGETATION (18 meter buffer)

Indicate the dominant type and record the dominant species present
- ☑ Trees
- ☐ Shrubs
- ☐ Grasses
- ☐ Herbaceous

dominant species present G. LANCIP

INSTREAM FEATURES

Estimated Reach Length 150 m

Estimated Stream Width 9 m

Sampling Reach Area _____ m²

Area in km² (m²/1000) _____ km²

Estimated Stream Depth _____ m

Surface Velocity (at thalweg) _____ m/sec

Canopy Cover
- ☐ Partly open
- ☑ Partly shaded
- ☐ Shaded

High Water Mark 3 m

Proportion of Reach Represented by Stream Morphology Types
- ☐ Riffle 10 %
- ☐ Run 75 %
- ☐ Pool 15 %

Channelized ☐ Yes ☑ No

Dam Present ☑ Yes ☐ No Beaver

LARGE WOODY DEBRIS

LWD 1 m²

Density of LWD _____ m²/km² (LWD/ reach area)

AQUATIC VEGETATION

Indicate the dominant type and record the dominant species present
- ☐ Rooted emergent
- ☐ Rooted submergent
- ☐ Rooted floating
- ☐ Free floating
- ☐ Floating Algae
- ☑ Attached Algae

dominant species present _____

Portion of the reach with aquatic vegetation 5 %

WATER QUALITY

Temperature 6.4 °C

Specific Conductance 4615

Dissolved Oxygen 12.05 mg/L

pH 8.31

Turbidity 2.5 NTU

WQ Instrument Used _____

Water Odors
- ☐ Normal/None
- ☑ Sewage
- ☐ Petroleum
- ☐ Chemical
- ☐ Fishy
- ☐ Other _____

Water Surface Oils
- ☐ Slick
- ☑ Sheen
- ☐ Globs
- ☐ Flecks
- ☐ None
- ☐ Other _____

Turbidity (if not measured)
- ☐ Clear
- ☑ Slightly turbid
- ☐ Turbid
- ☐ Opaque
- ☐ Stained
- ☐ Other _____

SEDIMENT/ SUBSTRATE

Odors
- ☐ Normal
- ☑ Sewage
- ☐ Petroleum
- ☐ Chemical
- ☐ Anaerobic
- ☐ None
- ☐ Other _____

Oils
- ☐ Absent
- ☑ Slight
- ☐ Moderate
- ☐ Profuse

Deposits
- ☐ Sludge
- ☐ Sawdust
- ☐ Paper fiber
- ☑ Sand
- ☐ Relict shells
- ☑ Other Silt

Looking at stones which are not deeply embedded, are the undersides black in color?
- ☑ Yes
- ☐ No

INORGANIC SUBSTRATE COMPONENTS (should add up to 100%)			ORGANIC SUBSTRATE COMPONENTS (does not necessarily add up to 100%)		
Substrate Type	**Diameter**	**% Composition in Sampling Reach**	**Substrate Type**	**Characteristic**	**% Composition in Sampling Area**
Bedrock		0	Detritus	sticks, wood, coarse plant materials (CPOM)	10
Boulder	> 256 mm (10")	0			
Cobble	64-256 mm (2.5"-10")	25	Muck-Mud	black, very fine organic (FPOM)	5
Gravel	2-64 mm (0.1"-2.5")	60			
Sand	0.06-2mm (gritty)	10	Marl	grey, shell fragments	0
Silt	0.004-0.06 mm	5			
Clay	< 0.004 mm (slick)	0			

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (FRONT)

STREAM NAME Jacobs Fork @ head	LOCATION
STATION # _____ RIVERMILE _____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN
STORET #	AGENCY Potesta
INVESTIGATORS JG/JH/CS/WM/JPW	
FORM COMPLETED BY JH/JG	DATE 12/2/05 TIME 1400 AM (PM)	REASON FOR SURVEY Tier 2.5 classification

Parameters to be evaluated in sampling reach

Habitat Parameter	Condition Category			
	Optimal	Suboptimal	Marginal	Poor
1. Epifaunal Substrate/ Available Cover	Greater than 70% of substrate favorable for epifaunal colonization and fish cover; mix of snags, submerged logs, undercut banks, cobble or other stable habitat and at stage to allow full colonization potential (i.e., logs/snags that are not new fall and not transient).	40-70% mix of stable habitat; well-suited for full colonization potential; adequate habitat for maintenance of populations; presence of additional substrate in the form of newfall, but not yet prepared for colonization (may rate at high end of scale).	20-40% mix of stable habitat; habitat availability less than desirable; substrate frequently disturbed or removed.	Less than 20% stable habitat; lack of habitat is obvious; substrate unstable or lacking.
SCORE 13	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
2. Embeddedness	Gravel, cobble, and boulder particles are 0-25% surrounded by fine sediment. Layering of cobble provides diversity of niche space.	Gravel, cobble, and boulder particles are 25-50% surrounded by fine sediment.	Gravel, cobble, and boulder particles are 50-75% surrounded by fine sediment.	Gravel, cobble, and boulder particles are more than 75% surrounded by fine sediment.
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
3. Velocity/Depth Regime	All four velocity/depth regimes present (slow-deep, slow-shallow, fast-deep, fast-shallow). (Slow is < 0.3 m/s, deep is > 0.5 m.)	Only 3 of the 4 regimes present (if fast-shallow is missing, score lower than if missing other regimes).	Only 2 of the 4 habitat regimes present (if fast-shallow or slow-shallow are missing, score low).	Dominated by 1 velocity/ depth regime (usually slow-deep).
SCORE 9	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
4. Sediment Deposition	Little or no enlargement of islands or point bars and less than 5% of the bottom affected by sediment deposition.	Some new increase in bar formation, mostly from gravel, sand or fine sediment; 5-30% of the bottom affected; slight deposition in pools.	Moderate deposition of new gravel, sand or fine sediment on old and new bars; 30-50% of the bottom affected; sediment deposits at obstructions, constrictions, and bends; moderate deposition of pools prevalent.	Heavy deposits of fine material, increased bar development; more than 50% of the bottom changing frequently; pools almost absent due to substantial sediment deposition.
SCORE 14	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
5. Channel Flow Status	Water reaches base of both lower banks, and minimal amount of channel substrate is exposed.	Water fills >75% of the available channel; or <25% of channel substrate is exposed.	Water fills 25-75% of the available channel, and/or riffle substrates are mostly exposed.	Very little water in channel and mostly present as standing pools.
SCORE 16	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0

HABITAT ASSESSMENT FIELD DATA SHEET—HIGH GRADIENT STREAMS (BACK)

Parameters to be evaluated broader than sampling reach

Habitat Parameter	Condition Category			
	Optimal	**Suboptimal**	**Marginal**	**Poor**
6. Channel Alteration	Channelization or dredging absent or minimal; stream with normal pattern.	Some channelization present, usually in areas of bridge abutments; evidence of past channelization, i.e., dredging, (greater than past 20 yr) may be present, but recent channelization is not present.	Channelization may be extensive; embankments or shoring structures present on both banks; and 40 to 80% of stream reach channelized and disrupted.	Banks shored with gabion or cement; over 80% of the stream reach channelized and disrupted. Instream habitat greatly altered or removed entirely.
SCORE 15	20 19 18 17 16	15 14 13 12 11	10 9 8 7 6	5 4 3 2 1 0
7. Frequency of Riffles (or bends)	Occurrence of riffles relatively frequent; ratio of distance between riffles divided by width of the stream <7:1 (generally 5 to 7); variety of habitat is key. In streams where riffles are continuous, placement of boulders or other large, natural obstruction is important.	Occurrence of riffles infrequent; distance between riffles divided by the width of the stream is between 7 to 15.	Occasional riffle or bend; bottom contours provide some habitat; distance between riffles divided by the width of the stream is between 15 to 25.	Generally all flat water or shallow riffles; poor habitat; distance between riffles divided by the width of the stream is a ratio of >25.
SCORE 10	20 19 18 17 16	15 14 13 12 11	(10) 9 8 7 6	5 4 3 2 1 0
8. Bank Stability (score each bank) Note: determine left or right side by facing downstream.	Banks stable; evidence of erosion or bank failure absent or minimal; little potential for future problems. <5% of bank affected.	Moderately stable; infrequent, small areas of erosion mostly healed over. 5-30% of bank in reach has areas of erosion.	Moderately unstable; 30-60% of bank in reach has areas of erosion; high erosion potential during floods.	Unstable; many eroded areas; "raw" areas frequent along straight sections and bends; obvious bank sloughing; 60-100% of bank has erosional scars.
SCORE 6 (LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE 8 (RB)	Right Bank 10 9	(8) 7 6	5 4 3	2 1 0
9. Vegetative Protection (score each bank)	More than 90% of the streambank surfaces and immediate riparian zone covered by native vegetation, including trees, understory shrubs, or nonwoody macrophytes; vegetative disruption through grazing or mowing minimal or not evident; almost all plants allowed to grow naturally.	70-90% of the streambank surfaces covered by native vegetation, but one class of plants is not well-represented; disruption evident but not affecting full plant growth potential to any great extent; more than one-half of the potential plant stubble height remaining.	50-70% of the streambank surfaces covered by vegetation; disruption obvious; patches of bare soil or closely cropped vegetation common; less than one-half of the potential plant stubble height remaining.	Less than 50% of the streambank surfaces covered by vegetation; disruption of streambank vegetation is very high; vegetation has been removed to 5 centimeters or less in average stubble height.
SCORE 6 (LB)	Left Bank 10 9	8 7 (6)	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 6	5 4 3	2 1 0
10. Riparian Vegetative Zone Width (score each bank riparian zone)	Width of riparian zone >18 meters; human activities (i.e., parking lots, roadbeds, clear-cuts, lawns, or crops) have not impacted zone.	Width of riparian zone 12-18 meters; human activities have impacted zone only minimally.	Width of riparian zone 6-12 meters; human activities have impacted zone a great deal.	Width of riparian zone <6 meters: little or no riparian vegetation due to human activities.
SCORE 5 (LB)	Left Bank 10 9	8 7 6	5 4 3	2 1 0
SCORE 6 (RB)	Right Bank 10 9	8 7 (6)	5 4 3	2 1 0

Total Score 130

BENTHIC MACROINVERTEBRATE FIELD DATA SHEET

STREAM NAME Jacobs Fork @ head	LOCATION
STATION # _____ RIVERMILE _____	STREAM CLASS
LAT _____ LONG _____	RIVER BASIN
STORET #	AGENCY
INVESTIGATORS JH/JG/WM/CS/JPW	LOT NUMBER
FORM COMPLETED BY JH/JG	DATE 12/2/05 TIME 1400 AM (PM)
REASON FOR SURVEY Tier 2.5 classification	

HABITAT TYPES	**Indicate the percentage of each habitat type present** ☐ Cobble_____% ☐ Snags_____% ☐ Vegetated Banks_____% ☐ Sand_____% ☐ Submerged Macrophytes_____% ☐ Other (_____)_____%
SAMPLE COLLECTION	Gear used ☐ D-frame ■ kick-net ☐ Other _____ **How were the samples collected?** ■ wading ☐ from bank ☐ from boat **Indicate the number of jabs/kicks taken in each habitat type.** ☐ Cobble_____ ☐ Snags_____ ☐ Vegetated Banks_____ ☐ Sand_____ ☐ Submerged Macrophytes_____ ■ Other (4 in riffle/run areas)
GENERAL COMMENTS	saw abundant tipulids, some hellgramites (sp?), mayflies, crawdads, sculpin.

QUALITATIVE LISTING OF AQUATIC BIOTA

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare, 2 = Common, 3= Abundant, 4 = Dominant

Periphyton	0	1	2	(3)	4	Slimes	(0)	1	2	3	4
Filamentous Algae	0	(1)	2	3	4	Macroinvertebrates	0	1	(2)	3	4
Macrophytes	0	(1)	2	3	4	Fish	0	1	(2)	3	4

FIELD OBSERVATIONS OF MACROBENTHOS

Indicate estimated abundance: 0 = Absent/Not Observed, 1 = Rare (1-3 organisms), 2 = Common (3-9 organisms), 3= Abundant (>10 organisms), 4 = Dominant (>50 organisms)

Porifera	(0)	1	2	3	4	Anisoptera	0	1	2	3	4	Chironomidae	0	1	2	3	4
Hydrozoa	(0)	1	2	3	4	Zygoptera	0	1	2	3	4	Ephemeroptera	0	1	2	3	4
Platyhelminthes	0	(1)	2	3	4	Hemiptera	0	1	2	3	4	Trichoptera	0	1	2	3	4
Turbellaria	(0)	1	2	3	4	Coleoptera	0	1	2	3	4	Other	0	1	2	3	4
Hirudinea	0	1	2	3	4	Lepidoptera	0	1	2	3	4						
Oligochaeta	0	(1)	2	3	4	Sialidae	0	1	2	3	4						
Isopoda	0	1	2	3	4	Corydalidae	0	1	2	3	4						
Amphipoda	0	1	2	3	4	Tipulidae	0	1	2	(3)	4						
Decapoda	0	1	2	3	4	Empididae	0	1	2	3	4						
Gastropoda	0	(1)	2	3	4	Simuliidae	0	1	2	3	4						
Bivalvia	(0)	1	2	3	4	Tabinidae	0	1	2	3	4						
						Culcidae	0	1	2	3	4						

SITE NAME: Jacobs Fork, 1,200m Upstream confluence with Dry Fork		DATE: 11/30/05
SITE ID CODE: JF-1		TIME: 13:00
SURVEY CREW MEMBERS: JG/CS/JH/DW/MM		
TOTAL SHOCK TIME: 7,470 sec	TOTAL SHOCK DISTANCE: 150m	
TOTAL FISHING TIME: 4 hrs	START: 13:00	FINISH: 17:00

CAMERA ID CODE: CAm B

START OF EF ZONE:	END OF EF ZONE:
UPSTREAM VIEW - PHOTO#: 1	UPSTREAM VIEW - PHOTO#: X
DOWNSTREAM VIEW - PHOTO #: X	DOWNSTREAM VIEW - PHOTO #: 2
NOTES:	NOTES:

FIELD WATER CHEMISTRY

TEMP 7.8°C CONDUCTIVITY 57.1 µS pH 7.90 DO 11.87 mg/L TURBIDITY 7.9 NTU

DETAILED DIRECTIONS TO SITE: 460 W to Rt 16 N
site is on Rt. 16

DETAILED SITE SKETCH:

See Habitat Forms

TRANSECT Width/Depth
12 m

ZONE CHARACTERISTICS	
Percent Riffle:	80
Percent Run:	15
Percent Pool:	5
Depth of Riffle:	.3 ft
Max. Depth of Pool:	1.0 ft

Name of Stream: Jacob's Fork #1 Personnel: JG/JH/wm/cs/JPW

Date: 11/30/05 Time: 1300 Weather: 43°F Clr / Sunny

Stream Conditions: Normal Clear

Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
N Hogsucker	5	150-199		PASS 1 Note Black Spots
"	1	145		5675
"	1	220		
"	1	168		
"	1	110		
"	16	50-99		
Greenside Darter	4	50-99		
"	3	50-99		
"	1	0-49		
Banded Darter	2	50-99		
Rainbow Darter	8	50-99		
Fantail Darter	3	50-99		
"	1	0-49		
Johnny Darter	2	0-49		
Greenside Darter	2	0-49		
Rainbow Darter	12	0-49		
Banded Darter	6	0-49		
Rainbow Darter	5	50-99		
"	1	0-49		
C. Stoneroller	6	150-199		
"	13	100-149		
"	19	50-99		
"	3	0-49		
"	3	50-99		
"	1	50-99		
"	1	0-49		
Mottled Sculpin	2	100-149		
"	15	50-99		
"	5	0-49		
Black Nose Dace	5	50-99		
"	12	0-49		↓
Smallmouth Bass	1	223	12h.5	No Black Spots
N Hogsucker	5	150-199		Black spots
"	1	110		
"	7	50-99		
Greenside Darter	6	50-99		
N Hogsucker	1	65		
Rainbow Darter	3	50-99		
"	4	0-49		
Greenside Darter	1	45		
Mottled Sculpin	1	104		
"	27	50-99		
"	2	0-49		
C. Stoneroller	2	100-149		
"	19	50-99		↓ ↓

SITE NAME: Jacobs Fork		DATE: 12/1/05
SITE ID CODE: JF-1		TIME: 13:00
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:	*END OF EF ZONE:*
UPSTREAM VIEW - PHOTO#:_____	UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____	DOWNSTREAM VIEW - PHOTO #:_____
NOTES:	NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth
ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

$675
1795
-1470

Name of Stream: Jacob's Fork #1 Personnel: JG/JH/wm/cs/JAW

Date: 11/30/05 Time: 1300 Weather: 43°F Clear Sunny

Stream Conditions: Normal Clear

Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
Black Nose Dace	34	50-99		PASS I CON'T Black Spots
N Hogsucker	1	192		
White Sucker	4	50-99		
Creek Chub	1	115		
"	1	57		
Rainbow Darter	6	50-99		
Johnny Darter	1	50-99		
"	9	0-49		
Rainbow Darter	3	0-49		
Banded Darter	1	0-49		
Mottled Sculpin	19	50-99		
"	3	0-49		
C. Stoneroller	2	100-149		
"	13	50-99		
Creek Chub	1	85		
Black Nose Dace	17	50-99		
Blunt Nose Minnow	1	0-49		
Black Nose Dace	1	0-49		
N Hogsucker	8	150-199		
Stony Rollers	8	100-149		
Stone Rollers	12	50-99		
Mottled Sculpin	5	50-99		
" "	1	0-49		
Hog Sucker	1	5		
Cutlip Shiner	3	50-75		
Banded Darter	1	0-49		
Banded Darter	1	50-99		
Rainbow Darter	4	50-99		
" "	1	0-49		
Stone Roller	1	50-99		
Stone Roller	1	50-99		
Blacknose Dace	12	50-99		Black spots
" "	1	0-49		
Striped Shiner	3	50-99		
" "	1	0-49		
Spotfin Shiner	2	50-99		
Blue Lined Minnow	1	0-49		
Mottled Sp	4	50-99		
Blue Lined Minnow	1	0-49		
Mottled Sp	12	0-49		
Blue lined Minnow	1	0-99		
Mottled Sp	3	0-99		
Blue Lined	2	50-99		
Striped Shiner	1	50-99		
Mottled	10	50-99		

1795 second pass

SITE NAME: Jacobs Fork		DATE: 12/1/05
SITE ID CODE: JF-1		TIME: 13:00
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

END OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth
ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

Name of Stream: _____ Personnel: _____

Date: _____ Time: _____ Weather: _____

Stream Conditions: _____

Site Description: _____

Species	Number	Length (mm)	Weight (g)	Notes
Hog Sucker	2	> 200		2nd pass
"	19	150-200		
"	24	100-150		
"	5	50-100		
Tangerine Darter	11	50-100		
Hog Sucker	1	72		
Tuhaw Darter	12	250		
Banded Darter	4	<50		
Rain Bow Darter	1	50-100		
"	4	<50		
Stone rollers	23	110-150		
"	1	157		
"	13 14	50-100		
Hog Suckers	2	50-100		
M. Smallmouth	72	50-100		
"	3 X	<50		
Stone Roller	2	50-100		
Hog Sucker	1	74		
Blacknose Dace	12 15	50-100		
M. Notropis	2	0-50		✓

SITE NAME: Jacobs Fork @ Squire		DATE: 12/2/05
SITE ID CODE: JF-2		TIME: 8:50
SURVEY CREW MEMBERS: JG/JW/CS/WM/JH		
TOTAL SHOCK TIME: 7,916 sec	TOTAL SHOCK DISTANCE: 150 m	
TOTAL FISHING TIME: 5 hrs	START: 8:50	FINISH: 13:50

CAMERA ID CODE: CAm B

START OF EF ZONE:	END OF EF ZONE:
UPSTREAM VIEW - PHOTO#: 7	UPSTREAM VIEW - PHOTO#: X
DOWNSTREAM VIEW - PHOTO #: X	DOWNSTREAM VIEW - PHOTO #: 8
NOTES:	NOTES:

FIELD WATER CHEMISTRY

TEMP 33°C CONDUCTIVITY 508 uS pH 8.12 DO 13.45 mg/L TURBIDITY 2.0 NTU

DETAILED DIRECTIONS TO SITE:

Site B town of Squire

DETAILED SITE SKETCH:

SCE Habitat Forms

TRANSECT Width/Depth
11 m

ZONE CHARACTERISTICS	
Percent Riffle:	60
Percent Run:	25
Percent Pool:	15
Depth of Riffle:	.25 ft
Max. Depth of Pool:	.50 ft

Name of Stream: JF 2 Jacob's Fork @ Source Personnel: JG/JH/WM/CS/JPW

Date: 12/2/05 Time: 0850 Weather: Sunny, 30°F

Stream Conditions: Low, Clear

Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
N Hogsucker	1	157		PASS 1 Black Spots
"	1	94		" "
Golden Redhorse	1	63		
Mottled Sculpin	2	50-99		
"	4	0-49		
Black Nose Dace	7	50-99		Black Spots
"	5	0-49		"
Creek Chub	1	134		"
"	4	50-99		"
"	6	50-99		"
"	1	0-49		"
C Stoneroller	11	100-149		"
"	24	50-99		" ~50%
"	1	0-49		"
Creek Chub	1	42		"
Striped Shiner	1	98		
Smallmouth Bass	1	47		
Rock Bass	1	143		
"	1	219		
Blunt Nose Minnow	1	70		
Rainbow Darter	6	50-99		
"	8	0-49		
N Hogsucker	1	166		
"	1	143		
"	5	50-99		
Mottled Sculpin	7	0-49		
Greenside Darter	3	50-99		
Rainbow Darter	9	50-99		
"	7	0-49		
C Stoneroller	1	145		
"	3	100-149		
"	20	50-99		
N Hogsucker	1	183		
"	13	50-99		
White Sucker	1	81		
M. Sculpin	1	83		
"	6	50-99		
"	6	0-49		
Rainbow Darter	4	50-99		
"	5	0-49		
C Stoneroller	1	110		
"	1	99		
"	22	50-99		~50% w/ Black Spots
Creek Chubs	16	50-99		~75% " " "
"	6	0-49		" " " "

SITE NAME: Jacobs Fork @ Squire		DATE: 12/2/05
SITE ID CODE: JF-2		TIME: 8:50
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

END OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth
ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

5665
2251
7916

Name of Stream: JF 2 Jacob's Fork @ Sanure Personnel: JG/JH/[illegible]

Date: 12/12/05 Time: 0850 Weather: 30°F Sunny

Stream Conditions: Low ; Clear

Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
Black Nose Dace	32	50-99		PASS 1 CONT
"	18	50-99		
"	18	0-49		
M Sculpin	2	0-49		
Rainbow Darter	1	50-99		
"	1	0-49		
Creek Chub	6	50-99		Black Spots
Striped Shiner	1	85		
Blunt Nose Minnow	8	50-99		
C Stoneroller	1	53		
"	1	52		
Black Nose Dace	11	0-49		
Blunt Nose Minnow	4	50-99		
"	2	0-49		
Creek Chub	1	53		
C Stoneroller	1	51		
M. Sculpin	1	0-49		
Black Nose Dace	5	0-49		
Blunt Nose Minnow	1	48		Black spots
Hog Sucker	4	150-199		
"	1	200+		
Stoneroller	3	100-149		
Mottled Sculpin	3	50-99		
Hog Sucker	1	150-199		
Bluntnose minnow	2	0-49		
Creek Chub	12	50-99		
Bluntnose minnow	1	50-99		
Rainbow Darter	3	0-49		
Creek Chub	12	0-49		Black spots
M. Sculpin	1	0-49		
Satinfin Shiner	4	50-99		
Rosyface Shiner	2	50-99		
Striped Shiner	1	50-99		
[illegible] Shiner	40	50-99		
" " "	13	0-49		
Banded Darter	2	50-99		
Rainbow Darter	4	50-99		
Stoneroller	40	50-99		
M. Sculpin	1	0-49		
Hog Sucker	3	50-99		
Blacknose Dace	101	50-99		
" "	32	0-49		
Striped Shiner	1	0-49		
Hog Sucker	1	0-49		

SITE NAME: Jacobs Fork @ Squire		DATE: 12/2/05
SITE ID CODE: JF-2		TIME: 8:50
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:

UPSTREAM VIEW - PHOTO#:_____

DOWNSTREAM VIEW - PHOTO #:_____

NOTES:

END OF EF ZONE:

UPSTREAM VIEW - PHOTO#:_____

DOWNSTREAM VIEW - PHOTO #:_____

NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth
ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

Name of Stream: JF2 Jacobs Fork @ Spencer Personnel: [illegible]
Date: 12/2/05 Time: 0850 Weather: 30°F Sun
Stream Conditions: Low Clear
Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
N. Hog Sucker	17	50-99		Pass 1 cont'd
	2	0-49		
White Sucker	1	50-99		
Golden Red Horse	1	50-99		
M. Sculpin	12	50-99		
" "	11	0-49		
Rock Chub	1	50-99		
Creek Chub	2	0-49		
Blacknose Dace	68	50-99		
" "	14	0-49		
Stone Rollers	9	100-149		
" "	36	50-99		
Greenside Darter	1	100-149		
" "	2	50-99		
Rainbow Darter	10	50-99		
" "	20	0-49		
Banded Darter	1	0-49		
				PASS #2
Small mouth Bass	1	215		
Rock Bass	1	130		
Rock Bass	1	116		
N. Hog Suckers	1	220		
" "	6	150-199		
M. Sculpin	14	50-99		
N. Hog Suckers	10	50-99		
Green Side Darter	1	100		
N. Hog Sucker	4	50-99		
Stone Roller	8	100-150		Black spots
" "	1	155		" "
" "	44	50-99		Black Spots
Creek Chub	18	50-99		" "
" "	2	0-49		" "
Bluehead Minnow	2	50-99		" "
M. Sculpin	6	50-99		
" "	5	0-49		
Hog Sucker	1	104		
Blacknose Dace	56	50-99		Black Spots
M. Sculpin	1	0-49		
Blacknose Dace	9	50-99		
" "	5	0-49		
Rainbow Darter	12	50-99		
Green side Darter	1	96		
Banded Darter	1	49		
Bluehead minnow	2	0-49		

1st pass 5665
2nd 2251

SITE NAME: Jacobs Fork Above		DATE: 12/2/05
SITE ID CODE: JF-2		TIME: 8:50
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:	*END OF EF ZONE:*
UPSTREAM VIEW - PHOTO#:_____	UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____	DOWNSTREAM VIEW - PHOTO #:_____
NOTES:	NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth

ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

Name of Stream: JF2 @ Spur Personnel:

Date: Time: Weather:

Stream Conditions:

Site Description:

Species	Number	Length (mm)	Weight (g)	Notes
Blacknose Minnow	2	50-99		Pass 2 cont'd
Rainbow Darter	6	50-99		
Striped Shiner	1	50-99		
Rainbow Darter	9	50-99		
Stoneroller	1	50-99		
Rainbow Darter	8	0-49		
Satinfin Shiner	1	50-99		
Blacknose Minnow	1	50-99		
Striped/Mimic Shiner	9	50-99		

SITE NAME: Jacob's Fork @ Head		DATE: 12/2/05
SITE ID CODE: JF-3		TIME: 1400
SURVEY CREW MEMBERS: JPW, JH, CS, WM		
TOTAL SHOCK TIME: 5,248 sec	TOTAL SHOCK DISTANCE: 150 m	
TOTAL FISHING TIME: 3.5 hrs	START: 14:00	FINISH: 17:30

CAMERA ID CODE: CAM B

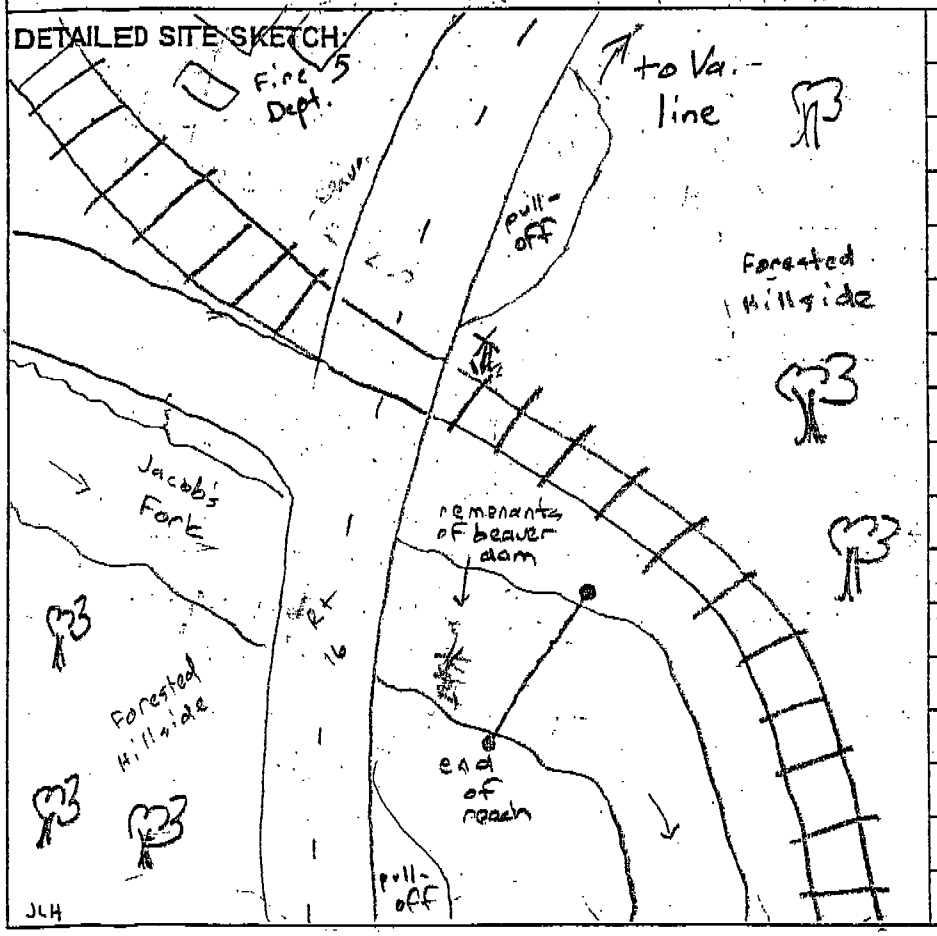
START OF EF ZONE:	*END OF EF ZONE:*
UPSTREAM VIEW - PHOTO#: 9	UPSTREAM VIEW - PHOTO#: X
DOWNSTREAM VIEW - PHOTO #: X	DOWNSTREAM VIEW - PHOTO #: 10
NOTES:	NOTES:

FIELD WATER CHEMISTRY

TEMP 6.4 °C CONDUCTIVITY 461 pH 8.31 DO 12.05 mg/L TURBIDITY 2.5

DETAILED DIRECTIONS TO SITE: (see site descr. on back)

DETAILED SITE SKETCH:



TRANSECT Width/Depth
9 m

ZONE CHARACTERISTICS	
Percent Riffle:	10
Percent Run:	75
Percent Pool:	15
Depth of Riffle:	.25 ft
Max. Depth of Pool:	1.0 ft

Name of Stream: Jacobs Fk at head Personnel: JH | JG | WM | CS | JPW

Date: 12/2/05 Time: 1400 Weather: sunny (few if any clouds)

Stream Conditions: low | clear (typical Fall/winter baseflow)

Site Description: pull off rt before Va. line - upstr end of reach = riffle before 2ndary rt overpass/stream passes beneath 16). RR crossing also present

Species	Number	Length (mm)	Weight (g)	Notes
Black Nose Dace	21	50-99		PASS 1 3649
White Sucker	1	160		
"	1	120		
"	28	50-99		
White Sucker	12	50-99		
C Stoneroller	9	50-99		
Rock Bass	1	130		
"	1	92		
Creek Chub	1	137		
C Stoneroller	8	50-99		
"	3	100-149		
Black Nose Dace	11	50-99		
Mottled Sculpin	29	50-99		
C Stoneroller	11	50-99		
Striped Shiner	1	64		
Black Nose Dace	13	50-99		
C Stoneroller	28	0-49		
M. Sculpin	6	0-49		
"	1	50-99		
"	3	0-49		
C. Stoneroller	18	50-99		
"	14	0-49		~50 in w/ black spots
Creek Chub	1	52		black spots
Stone Roller	1	50-99		
Rainbow Darter	46	50-99		
" "	20	0-49		
Blacknose Dace	99	0-49		
M Sculpin	1	0-49		
Blacknose Dace	48	50-99		
Golden Red Horse	1	50-99		
Striped Shiner	34	0-49		
" "	2	50-99		
Blacknose Dace	1	0-49		✓
Stone Roller	1	0-49		
[illegible]				
[illegible]				PASS-2
White Sucker	1	150-199		
M Sculpin	11	50-99		
C. Stoneroller	14	50-99		
" "	2	0-49		
M Sculpin	16	0-49		
Rainbow Darter	5	50-99		
[illegible]	12	50-99		
Rainbow Darter	19	0-49		✓
Blacknose Dace	25	0-49		✓
M Sculpin	1	0-49		

1 1099

SITE NAME: Jacobs FK 6' Head		DATE: 12/2/05
SITE ID CODE: JF-3		TIME: 14:00
SURVEY CREW MEMBERS:		
TOTAL SHOCK TIME:	TOTAL SHOCK DISTANCE:	
TOTAL FISHING TIME:	START:	FINISH:

CAMERA ID CODE:_____

START OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

END OF EF ZONE:
UPSTREAM VIEW - PHOTO#:_____
DOWNSTREAM VIEW - PHOTO #:_____
NOTES:

FIELD WATER CHEMISTRY

TEMP_____ CONDUCTIVITY_____ pH_____ DO_____ TURBIDITY_____

DETAILED DIRECTIONS TO SITE:

DETAILED SITE SKETCH:

TRANSECT Width/Depth
ZONE CHARACTERISTICS
Percent Riffle:
Percent Run:
Percent Pool:
Depth of Riffle:
Max. Depth of Pool:

36/49

Name of Stream: _____ Personnel: _____

Date: _____ Time: _____ Weather: _____

Stream Conditions: _____

Site Description: _____

Species	Number	Length (mm)	Weight (g)	Notes
Blackmouth Dace	29	50-99		PASS 2
Rainbow Darter	4	0-49		
" "	1	50-99		
Striped Shiner	6	0-49		
M sculpin	1	0-49		
Smallmouth Redhorse	1	0-49		
Blackmouth Dace	1	0-49		↓

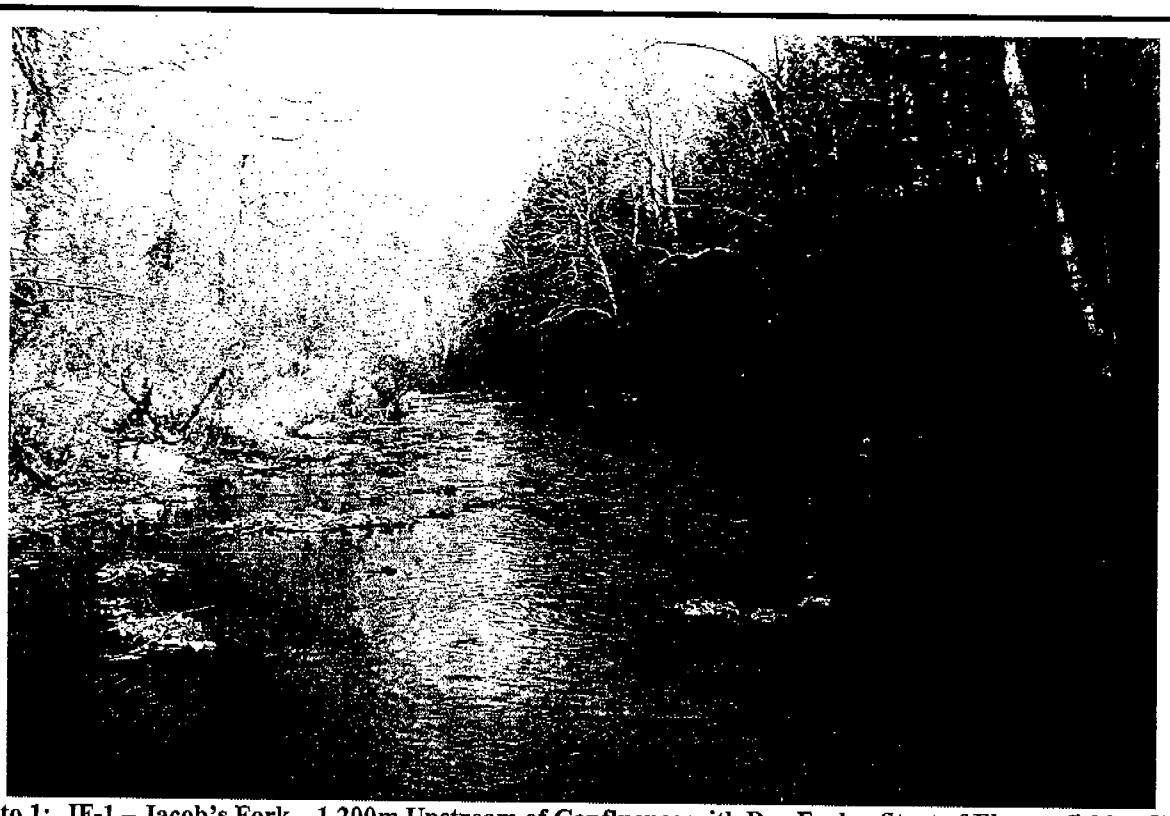


Photo 1: JF-1 – Jacob's Fork – 1,200m Upstream of Confluence with Dry Fork – Start of Electro-fishing Zone Upstream View – November 30, 2005

Photo 2: JF-1 – Jacob's Fork – 1,200m US of Confluence with Dry Fork – End of Electro-fishing Zone Downstream View – November 30, 2005

POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Brooks Run Mining
208 Business Street
Beckley, West Virginia 25802
Project No. 0101-05-0635

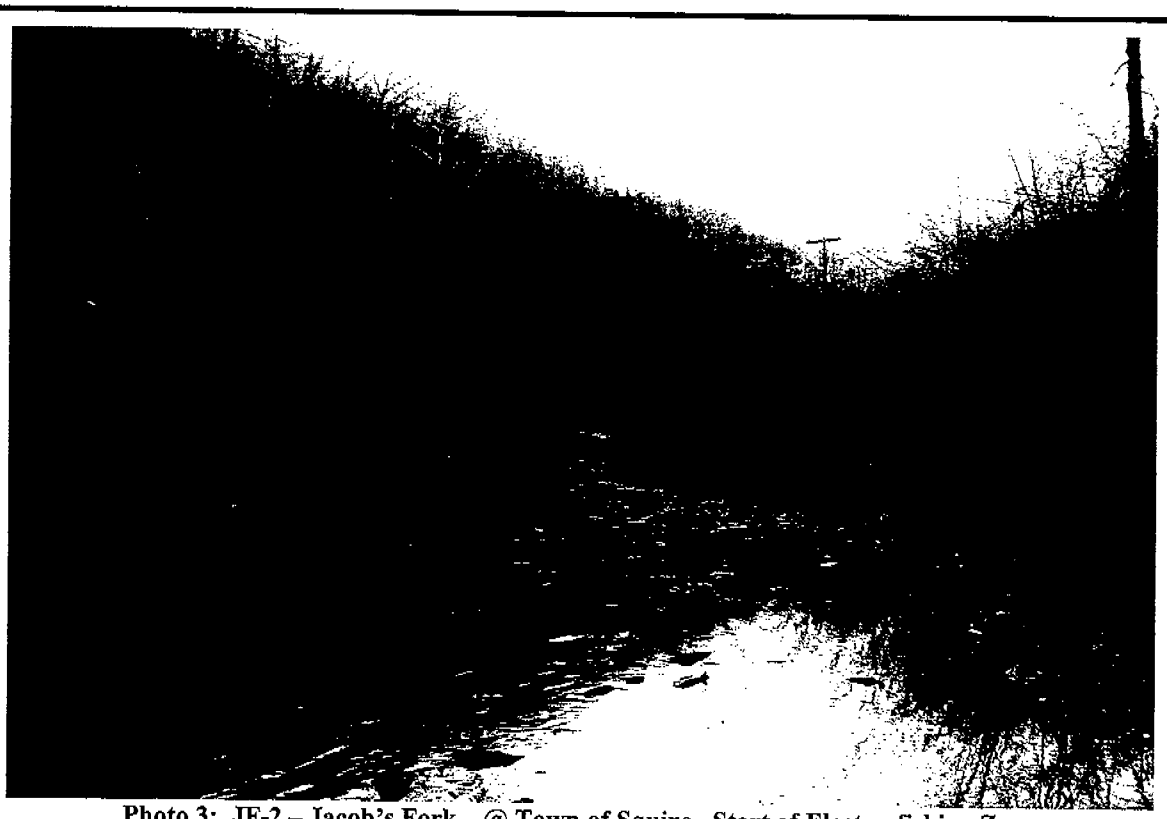


Photo 3: JF-2 – Jacob's Fork – @ Town of Squire– Start of Electro-fishing Zone
Upstream View – December 2, 2005

Photo 4: JF-2 – Jacob's Fork – @ Town of Squire – End of Electro-fishing Zone
Downstream View – December 2, 2005

POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Brooks Run Mining
208 Business Street
Beckley, West Virginia 25802
Project No. 0101-05-0635

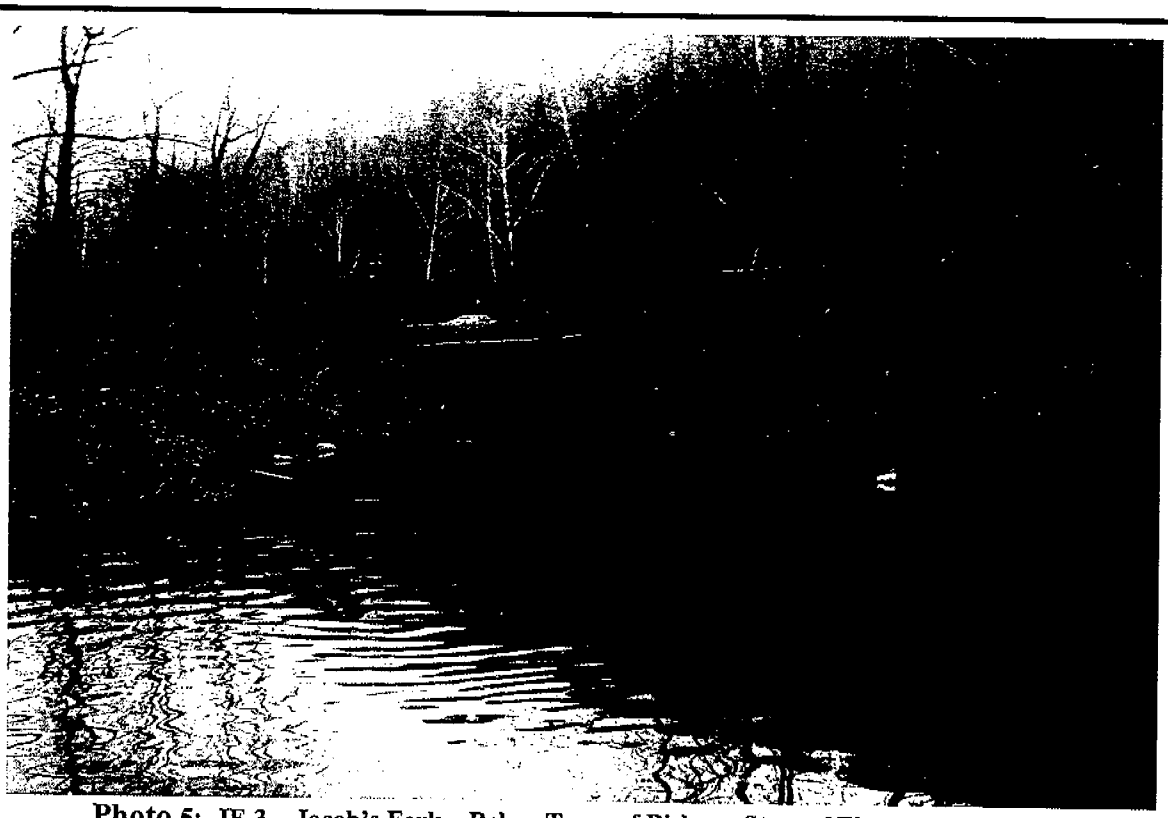


Photo 5: JF-3 – Jacob's Fork – Below Town of Bishop– Start of Electro-fishing Zone Upstream View –December 2, 2005

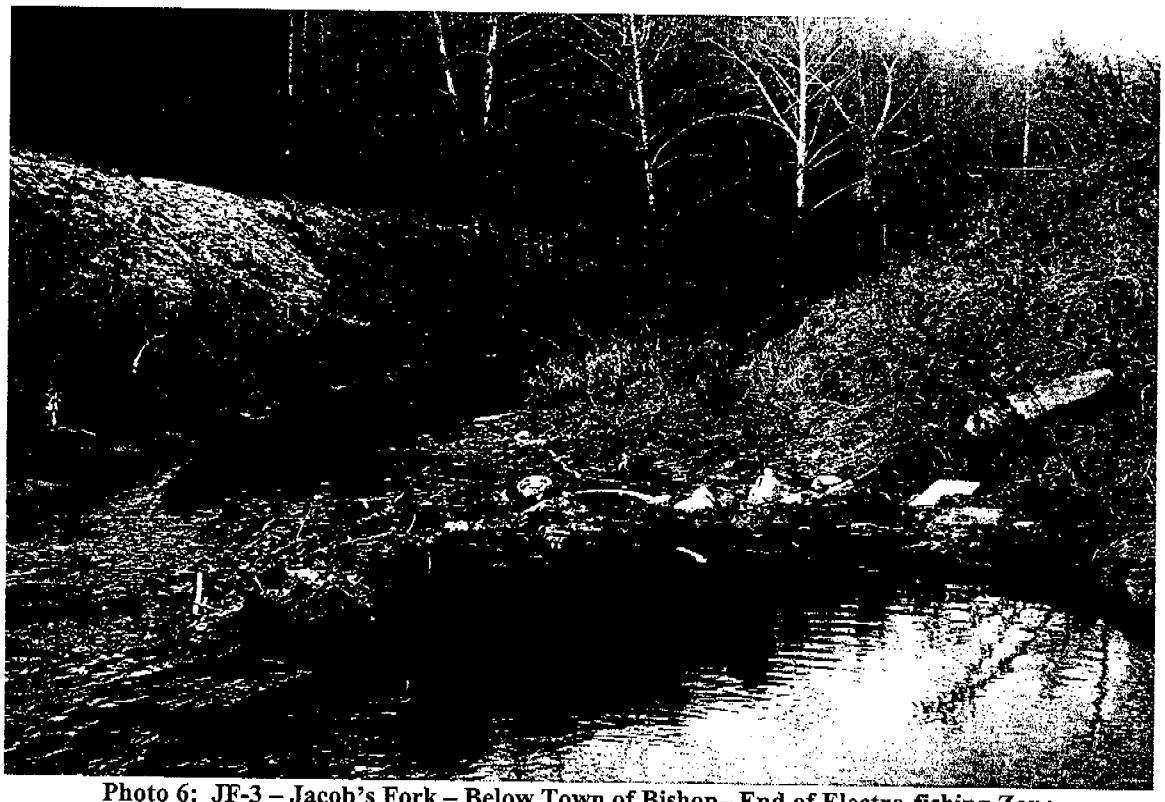


Photo 6: JF-3 – Jacob's Fork – Below Town of Bishop– End of Electro-fishing Zone Downstream View – December 2, 2005

POTESTA
Engineers and Environmental Consultants

7012 MacCorkle Avenue, SE
Charleston, West Virginia 25304
Phone: (304) 342-1400
Fax: (304) 343-9031

Brooks Run Mining
208 Business Street
Beckley, West Virginia 25802
Project No. 0101-05-0635

BERWIND LAND COMPANY

A SUBSIDIARY OF
BERWIND CORPORATION

300 SUMMERS STREET, SUITE 1050
CHARLESTON, WEST VIRGINIA 25301
TELEPHONE: 304-346-0569
FAX: 304-346-6516

July 17, 2006

VIA HAND DELIVERY
Ms. Lisa McClung, Director
Department of Environmental Protection
Division of Water and Water Management
601 57th Street SE
Charleston, WV 25304
Attn: Scott G. Mandirola, Water Quality Standards Program

Re: ***Proposed Designation of Jacobs Fork (BST-70-W) as a "Trout Water"***

Dear Director McClung:

I am submitting these comments on behalf of Berwind Land Company ("BLC") in response to the West Virginia's Department of Environmental Protection's ("DEP") proposal to add Jacobs Fork (BST-70-W) to the list of streams included in Appendix A of 47 CSR 2, commonly referred to as the "trout waters" list. BLC supports the DEP's efforts to assure the protection of the designated uses of state waters, including the protection of streams that have been properly designated as trout waters. Native trout populations should be given every chance to flourish in those streams that have the proper characteristics. In attempting to encourage native trout populations, the DEP must not be overzealous and designate waters for protection that do not support year-round populations, because in so doing, the DEP may wrongly inhibit landowners' ability to use their land and deter needed economic development in West Virginia.

The determination that Jacobs Fork qualifies as a "trout water" is a significant one with long-lasting ramifications for the activities that may occur along this stream. In light of the consequences that will follow if Jacobs Fork is added to the "trout waters" list, it is critical that DEP have clear factual support for its determination. In the case of Jacobs Fork, however, the DEP has incorrectly proposed to designate this stream a"trout water" without a sufficient evidentiary basis. As such, BLC believes that Jacobs Fork should be removed from the proposed list of "trout waters."

I. Background

Jacobs Fork is a tributary of the Tug Fork of the Big Sandy River. BLC is an adjacent landowner to Jacobs Fork and has plans to develop the mineral resources on this land. If Jacobs Fork is designated to have a "trout waters" use, this may require the entities who will develop this land to comply with more stringent effluent limitations and Best Management Practices. As a result, some types of economic development along Jacobs Fork may be deterred because of an inability to meet the standards necessary to protect the "trout waters" use. Because BLC derives income from leasing this land and from royalties from natural resources harvested under these leases, the proposed "trout waters" listing could have a significant impact on our company.

The West Virginia Division of Natural Resources ("DNR") conducted trout population surveys on July 26, 1983, August 15, 1984, and August 13, 1985.[1] It does not appear that any surveys of Jacobs Fork have been taken since 1985. Neither the DEP nor the DNR has described the methods used in these surveys, including how the aquatic species were counted or how long the survey lasted. The data sheets from these surveys typically provide only basic information about the gear used in the survey, the water temperature, and the number and size of the observed species. Occasionally the survey will include a brief comment from the biologist who took the survey about the condition of the stream.

II. DEP's data does not support Jacobs Fork's inclusion on the "trout waters" list

The "trout waters" use has been established to protect those streams, rivers, and lakes that support populations of trout that live in that water year-round. 47 CSR 2.20. The DEP has relied upon the DNR for information on whether a waterbody has an "existing use" of "trout waters" which is defined as any waterbody that currently, or has at any time since November 28, 1975, supported a year-round population of trout. A year-round population of trout can be established: 1) when there is natural reproduction of trout observed in the stream; or 2) when a stream survey reveals the presence of multiple year classes of a single trout species. The DEP's "Briefing Document" states that "[n]atural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys." "Briefing Document," p. 3. Under this definition, it is reasonable to assume that the DEP must have data showing that Jacobs Fork

[1] The DNR took two surveys at different points of Jacobs Fork on August 13, 1985.

has supported multiple year classes of trout. The data that DEP has offered in support of Jacobs Fork's inclusion simply does not establish that Jacobs Fork has ever supported multiple year classes of trout.

A. The DNR's stream surveys lack relevant information about Jacobs Fork

One major problem with the DEP's reliance on these surveys is that they do not indicate whether the trout observed were of multiple year classes or young-of-the-year. To add to the confusion, one of the data sheets for the August 13, 1985 states its purpose as evaluating fingerling stockings only. This is troubling for two reasons. First, it indicates that Jacobs Fork was a stocked stream, but the DNR stream survey does not make a note of this on any of the other data sheets. This indicates that important data may be absent from the DEP's files on Jacobs Fork and that it is inappropriate to include Jacobs Fork on the basis of the incomplete data that the agency does have. Second, the fact that Jacobs Fork was stocked makes it impossible for the DEP to conclude the presence of any species of trout in successive years means that there is a year-round population. The presence of trout in a stream in consecutive years may have been due to stocking. Furthermore, any difference in trout size may not be indicative of multiple year classes of trout, because the observed trout may have been stocked at different times of the year, leading to the difference in sizes.

What these surveys do detail is the number of trout that were collected and their size. Certainly, this information shows that trout can and have lived in Jacobs Fork. But without adequate information indicating that the trout were of multiple classes, BLC does not believe that the DEP has establish that Jacobs Fork has ever supported a year-round population of trout. Overall, the lack of knowledge about the methods employed in taking the surveys, combined with the limited amount of data contained in the data sheets from the surveys, make the DEP's reliance on them misplaced.

B. Natural reproduction has not been sufficiently documented in Jacobs Fork

The DEP's strongest argument for including Jacobs Fork on the "trout waters" list is the fact that one of the August 13, 1985, surveys states: "natural reproduction of rainbow trout noted at this station." Even this survey, however, does not establish that Jacobs Fork has supported a year-round population of trout at any time since November 28, 1975. The fish population sheet for this survey

indicates that 8 rainbow trout with a size range of zero inches were observed. Presumably, the presence of these fingerlings was the basis for the "natural reproduction" determination. However, as noted above, another survey taken that same day was conducted solely to evaluate fingerlings from stockings. Is it not possible that the fingerlings observed and thought to be the product of natural reproduction were actually derived from stocking?

In addition, the data sheet which contained the assertion that rainbow trout reproduction had been observed did not give any further details or otherwise elaborate on the basis for this claim. The lack of a complete record prevents the DEP from relying on this data to make a decision which will have such a significant and wide-ranging impact.

Finally, BLC supports the comments filed by the West Virginia Chamber of Commerce, especially with regard to the lack of clarity that surrounds when an "existing use" has been attained. BLC does not believe that a single observation of trout fingerlings can conclusively establish that Jacobs Fork has supported a year-round population of trout at any time since November 28, 1975.

III. Jacobs Fork suffers from "heavy domestic" pollution that makes it inappropriate to protect as a "trout water"

It should also be noted that the DNR's "West Virginia Stream Classification Form" lists Jacobs Fork's pollution rating as a "0." According to the DNR's rating system, a rating of "0" for pollution indicates that the pollution level in Jacobs Fork is severe. Unlike other ratings on the Classification Form which are based upon field observations and are necessarily subjective, the pollution rating is based upon the results of the stream survey taken on July 26, 1983. The 1985 survey revealed "heavy domestic" pollution in the stream. Due to this existing pollution, Jacobs Fork hardly seems to be the type of pristine trout stream that needs to be protected with the "trout waters" use.

In conclusion, it is clear that Jacobs Fork is not an appropriate candidate for inclusion on the "trout waters" list. First, the data sheets provided by DNR do not indicate whether multiple classes of trout are present in the stream. Second, DNR's surveys show that Jacobs Fork was being stocked with trout fingerlings at the time these surveys were being conducted. Unfortunately, DNR's data sheets do not offer any specifics about the type of trout that were stocked and that casts doubt on the DEP's ability to conclude that Jacobs Fork supported year-round trout populations at any point since 1975. Third, even the one survey which

allegedly found reproducing rainbow trout has fatal flaws. The data supporting DNR's assertion is incomplete and there is no evidence that the fingerlings were not the result of stocking. Fourth, as early as 1983 it was clear that Jacobs Fork had a serious domestic pollution problem that detracts from Jacobs Fork's status as a "trout water."

For all these reasons, Jacobs Fork should not be designated for a "trout waters" use at this time.

We appreciate the agency's review and consideration of these comments.

Very truly yours,

Randy D. Wright

Randy D. Wright
Vice President

RDW:dlc

S:\RDW Files\BLC Comments onJacobs Forks as Trout Waters.DOC

IOGA
WEST VIRGINIA

July 17, 2006

RECEIVED
JUL 17 2006
WATER QUALITY STDS

VIA HAND DELIVERY
Mr. Scott G. Mandirola
Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Re: ***Revisions to Aluminum Criteria and Trout Waters in 47 CSR 2***

Dear Mr. Mandirola:

On behalf of the Independent Oil and Gas Association of West Virginia, Inc. ("IOGA"), I am submitting comments regarding the permanent adoption of the interim chronic dissolved aluminum criteria and the list of trout waters proposed for inclusion in Appendix A of the water quality standards, 47 CSR 2. IOGA is a statewide non-profit trade association representing companies engaged in the exploration, production and development of natural gas and oil resources in West Virginia, and the companies and individuals who support these activities. By letter dated June 9, 2004, IOGA submitted a revised proposal to the Environmental Quality Board ("EQB") relating to the procedures that the Board should use to include streams on the "trout waters" list. A copy of this letter is attached for your review and incorporated by reference into this letter.

Aluminum Criteria Changes

IOGA strongly supports the DEP's proposal to finalize the interim aluminum criteria due to expire on July 4, 2007. IOGA encouraged the EQB to permanently adopt these proposed limits in 2004 when the EQB adopted the current interim limits. Two additional years of study have only strengthened IOGA's belief that there is ample evidence that the current interim standard is protective of the aquatic environments in West Virginia's streams and should be permanently adopted. The United States Environmental Protection Agency has subsequently agreed with this approach, approving the proposed aluminum standard "based on a finding that the criteria are protective of aquatic life use regardless of whether they apply temporarily or permanently."[1] For all of these reasons, IOGA believes that the DEP's action in permanently adopting the interim aluminum standard is reasonable and justified.

[1] See letter from Jon Capacasa, USEPA to Lisa McClung DEP dated January 9, 2006.

07-17-06 P04:39 IN

INDEPENDENT OIL & GAS ASSOCIATION OF WEST VIRGINIA
405 Capitol Street, Suite 507 Charleston, WV 25301 Phone (304) 344-9867 Fax (304) 344-5836

Additions to "Trout Waters" List

IOGA also strongly supports the Department of Environmental Protection ("DEP") in its role of assuring the protection of the designated uses of state waters and, in particular, for the protection of streams that have been properly designated as trout waters. The actual determination that a particular waterbody qualifies as a "trout water" is a significant one and has ramifications for the activities that may occur along that stream in the future. Therefore, it is critical that the process followed in assigning a designation of trout water allows for the consideration of all relevant information and reflects an accurate and scientifically sound application of the water quality regulations. As will be discussed below, IOGA believes that the DEP's current approach of adding 337 streams at one time to the "trout waters" list in Appendix A does not allow for the development of important information for each stream. Neither is this broad sweeping approach to listing streams as "trout waters" necessary to assure full protection of streams that properly fall within this category.

I. Adding such a large number of streams at one time does not assure that each listing is supported by adequate and accurate data

IOGA believes that the DEP should consider an alternate approach to adding these 337 streams to the "trout waters" list. Both the agency and the public would be better served by adding streams in phases as opposed to en masse, as has been proposed here. It is undeniable that adding over 300 streams at one time is an unwieldy process that has the potential to deny each stream the close scrutiny and examination that it deserves. We are concerned that if a stream is erroneously included on the "trout waters" use based upon insufficient data, it will be very difficult to correct this mistake at a later date. By taking into consideration fewer streams at one time, the DEP will be able to better justify its decision on whether to add or remove a stream from the "trout waters" list and avoid errors that may be difficult to correct in the future.

IOGA believes that a better method for updating the list of trout waters that avoids the procedural shortcomings of the massive listing of streams, while still moving the process forward at a reasonable pace, is to review the proposed list in phases. A phased approach would give the DEP and the public the opportunity to examine the data already collected by DNR, would allow the DEP to solicit comments on that data, to solicit additional information for each stream and, finally, to analyze all information collected in making a determination on whether it supports a "trout waters" use for a manageable number of streams. In cases where the data is incomplete or does not establish that year-round trout populations exist in the stream, the DEP and DNR would have the opportunity to further study the streams and determine their current capability for supporting year-round populations of trout. By taking these streams in phases, the DEP will also have the chance to correct some of the deficiencies in the underlying data from DNR that have been addressed by other commenters in this rule-making and pursuant to the proposed listing of Tier 2.5 waters under the Antidegradation Implementation Rule.

IOGA has previously suggested ways that a phased approach could be implemented. *See* attached letter dated June 9, 2004. A number of streams, ranging from 30 to 50, would be designated for review each year and public hearings would be arranged. We believe that holding hearings on the proposed addition of streams in the counties where these streams are located is essential to allowing full public participation in this process. Those streams that are determined to qualify as "trout waters" would be added to Appendix A during the next Triennial Review. While a phased approach will delay the inclusion of all the proposed streams on the "trout waters" list, this approach offers the benefit of providing the surrounding community the opportunity to become better educated and more involved in the process. Moreover, for the reasons stated below, a delay in adding a stream to the list in no way diminishes the protection that will be afforded to any stream that qualifies as a "trout water."

II. Listing a stream is not necessary to protect the "trout waters" use

The DEP's proposal to include these 337 streams on the "trout waters" list all in one rulemaking is unnecessary based upon the language of the water quality standards and the agency's own statements in its Briefing Document detailing the changes and circumstances requiring these changes to 47 CSR 2. Under Sec. 6.3.b of the water quality standards, captioned "Category B2 – Trout Waters," it is stated that this category includes all streams that meet the definition of "trout waters" contained in Sec. 2.20. This section further states that Appendix A, the list of streams, is "a representative list," indicating that it is not intended to be all inclusive. Confirming this point in the Briefing Document, DEP states that the Appendix A list is meant to be representative of the "trout waters" in the state, but is not meant to be an exhaustive list of all streams that fit the definition of "trout waters." Implicit in the DEP's reasoning is that any water that meets the definition of "trout waters" can be protected under that use whether or not it appears in Appendix A. As such, it is not necessary to add all 337 streams at one time and, in doing so, perhaps add streams that should not be included, because any stream can be protected as a "trout water" despite the fact that it does not appear in Appendix A.

For all of the reasons stated above, the mass addition of streams to Appendix A, as proposed, should not be pursued.

IOGA appreciates the opportunity to provide these comments on the proposed revisions to 47 CSR 2 and looks forward to the DEP's response.

Very truly yours,

Robert Radabaugh / by ABM

Robert Radabaugh
Chairman, IOGA Environmental Committee

Bright Enterprises

200 Greenbrier Rd., P. O. Box 460, Summersville, West Virginia 26651
Phone: 304/872-3000 Fax: 304/872-3040

July 17, 2006

Scott G. Mandirola, Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Confirming copy via USPS - Original was submitted via email on July 17, 2006

Subject: Comments Regarding Proposed Revisions to Existing Legislative Rules 47 CSR 2

Dear Mr. Mandirola:

Bright Enterprises is a Summersville, WV, based business group with interests in energy, travel and tourism, transportation, residential development, timber and timberlands, and other businesses. We own or have interests in properties and projects throughout West Virginia, and we are always concerned about regulatory proposals that would affect those business and property interests, and which would further affect the overall economic progress of our State.

We believe that certain elements of the currently proposed changes to 47 CSR 2, specifically but not necessarily limited to the proposed addition of 337 streams to the Appendix A list of known "trout waters", will have negative effects on the development and use of our properties and on our ongoing and planned businesses.

We also believe this dramatic expansion of listed "trout waters" is a major public policy issue for the State, and frankly one whose intent and implications appear not to have been adequately analyzed, considered, or explained by DEP. Speaking from our viewpoint, we feel quite in the dark about DEP's public policy intent for this proposal, but we foresee it to have significant consequences whether or not that is the agency's intent. Accordingly, we believe the proposal to designate these "trout waters" by listing them in Appendix A to 47 CSR 2 is premature, and should be withdrawn and reconsidered. Our rationale and additional information follows.

First, our companies are among the thousands of businesses represented by the West Virginia Chamber of Commerce (the Chamber). The Chamber has prepared and will today (July 17th) be filing comments on the proposed revisions to 47 CSR 2, including the proposed "trout waters" list expansion as well as other elements of the current proposal. We support and agree with the Chamber's comments, and ask that you consider the Chamber comments to be incorporated herein by reference. However, we would like to add certain specific observations and questions beyond those offered by the Chamber.

According to information provided by your agency, the current list includes 160 streams and/or lakes, and the new list as proposed will include 492 streams and lakes, more than tripling the number so designated. During the April 28, 2006, public information meeting at DEP headquarters agency representatives pointed out that even the list of 492 water bodies is "not definitive", and that the agency envisions that hundreds more streams might later be added.

Many of these same streams were proposed by DEP to be listed as Tier 2.5 streams pursuant to another ongoing but still pending regulatory action, specifically the Antidegradation Implementation Procedures (AIP) Rules. When we and others reviewed the data offered by DEP (including the WVDNR data) in support of the proposed Tier 2.5 stream designations, it was readily apparent that for many streams the data were extremely limited, and years or even decades out of date. By reasonable scientific standards such data were and are not adequate for significant regulatory decisions, and comments to that effect were offered in the context of the AIP.

Under the AIP, DEP and affected parties are still facing administrative and judicial appeals, as well as final consideration by the Legislature before any of the proposed Tier 2.5 stream designations are finalized. Because the data deficiency is one of the major objections to proposed Tier 2.5 listings, it was to say the least surprising when DEP published its intent to add the same streams (and many more) to the Appendix A "trout waters" list, based on what is apparently the same data. It seems that prudence would have dictated that the AIP review of the sufficiency of such data should have been allowed to run its course before DEP made another major regulatory proposal based on the same data.

As part of the AIP process our companies specifically objected to Tier 2.5 listing of the following streams, on the basis of concerns about the effect of such listing on our properties and businesses, but also because we believed the data (including trout data) cited by DEP pertaining to the streams were inadequate and scientifically deficient:

Big Run of Red Creek of Dry Fork, Randolph County (MC-60-O-1)
Red Creek of Dry Fork, Tucker and Randolph Counties (MC-60-O)
Dry Fork, Tucker County (MC-60)
Spruce Run of Dry Fork, Randolph County (MC-60-P)
Difficult Creek of North Branch Potomac River, Grant County (PNB - 18)
Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB - 16 - B)
Wycroff Run of Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB - 16 - B - 1)
Glade Creek of (Lower) New River, Raleigh County (KN - 29)
Pinch Creek of Glade Creek of (Lower) New River, Raleigh County (KN - 29 - E)
Rockcamp Run of Buffalo Creek of Elk River, Clay County (KE-50-I)
Piney Creek of (Lower) New River, Raleigh County (KN-26)

Each of these streams is now on your proposed Appendix A "trout waters" list. Whether or not the data are adequate to identify any or all of these or any streams as "trout waters", however, there are other concerns that we believe should have been and must be addressed by the agency before pursuing this "trout waters" list expansion.

Your "Briefing Document" for the proposed 47 CSR 2 changes includes a section entitled "Statement of Circumstances Which Require Rule". As one reads the portion of this section pertaining to the "trout waters" list, one sees that it fails to identify anything that could be construed as a "requirement". To our knowledge there is in fact no federal or other mandate compelling West Virginia to specially identify "trout waters" or to afford them protections in excess of those standards and limitations which are adequate for other streams.

We suggest that since the decision to so identify streams and lakes is one that is left to the State, then the State's implementing and rulemaking authority, DEP, owes it to the public and to affected property owners, local governments, and businesses to explain why this is appropriate and sound public policy. DEP should consider and define the public policy purposes and implications of "trout waters" listings, and clearly communicate such to affected parties and to the general public. If the current rule does not correctly reflect the State's public policy intent, appropriate modifications should be considered to correctly focus the intent of "trout waters" listings and to protect against unintended consequences.

We understand that the concept of "trout waters" as a stream use, along with additional protections for such waters, has existed in the West Virginia Water Quality Standards (WQS) for many years or even for decades. During that period, however, there have been myriad changes in permitting requirements, enforcement procedures, public participation processes, and other elements of the State's programs for protection of water quality and uses. Accordingly, it is our belief that the current day effect and implications of a stream being listed as a "trout water" are likely far different from those envisioned and intended when the concept was first incorporated into the WQS.

One of the most significant changes to the State's WQS program, and one that is clearly linked to the concept of "trout waters" is the 2001 Antidegradation Implementation Procedures (AIP) legislative rules, already discussed above. We frankly expect that a listing as an Appendix A "trout water" will eventually be used, as an alleged validation of the underlying trout data, to support back door attempts to regulate such streams under Tier 2.5 antidegradation standards. If this is not the intent of DEP, then the agency should correct its current proposal and process regarding "trout waters" listings so as to assure that such unintended consequences do not take place.

Next, DEP should consider that streams containing year round populations of trout (if in fact they do) are clearly not all equal. In the media much has been made of the economic benefits of trout fisheries. Through our travel and tourism interests we see that benefit, and support its

continuation and enhancement. However, it is obvious that many of the streams in question have not served and never will serve as fisheries.

Many of the streams on the proposed "trout waters" list are physically too small to serve as viable fisheries. Further, the full lengths of many of these streams, and much of the length of many others, are located entirely within private properties and are not legally accessible for fishing, whether or not they are physically fishable.

If the intent of listing streams as "trout waters" is to protect the economic benefit to the State of such fisheries, then streams or segments that factually do not serve as fisheries should not be listed. In such case perhaps the "trout waters" definition should be clarified to indicate that it pertains only to those streams which support year round populations of trout, and which by their physical size and nature, location, and access opportunities do in fact serve as trout fisheries.

On the other hand, if DEP sees it as appropriate to afford special protections to streams supporting year round trout populations "just because they are there", with no regard for the ancillary impacts of such designations, then DEP should explain its rationale as such.

If DEP believes that streams containing trout need to be protected as such on the basis of some perceived "public right" to such streams, regardless of the ownership of the lands within which such streams lie, DEP needs to communicate that intent to the public, and more importantly to taxpaying landowners.

If the public policy intent of a "trout waters" list is to control, decrease or prevent private property development along such streams, or if that is the inevitable outcome (as we strongly believe will be the case) then DEP needs to clearly tell the public that such is intended or that such will be a likely if unintended outcome.

Whatever the rationale behind DEP's decision to retain the "trout waters" concept, and to drastically expand its application by tripling the list of such waters, the public needs and deserves to have that rationale clearly described by WVDEP. We believe this is a very important public policy issue, and no matter how long the "trout waters" concept may have existed in the State's WQS, it should not be automatically perpetuated and expanded by DEP without the agency first thinking through and explaining why it believes this is the right thing to do from the public policy standpoint.

Simply put, what purposes is DEP trying to achieve, and what consequences does DEP intend and envision from identifying streams as "trout waters"? If upon thorough consideration DEP determines that the existing rules and definitions pertaining to "trout waters" do not correctly reflect appropriate public policy purposes, and that unintended consequences are therefore likely, the rules need to be corrected. Until such consideration is completed and clearly

stated by DEP to all interested parties, there should be no streams added to Appendix A. The public deserves to first know why DEP believes such action is appropriate, and what public policy purposes it is trying to achieve.

Sincerely Yours,

Stephen C. Keen

Stephen C. Keen, PE
Vice President - Engineering

American Electric Power
PO Box 1986
Charleston, WV 25327-1986

AEP
AMERICAN® ELECTRIC POWER

July 14, 2006

Lisa McClung, Director
Division of Water and Waste Management
601 57th Street SE
Charleston, WV 25304

Comments on Proposed Amendments
West Virginia Water Quality Standards
47 CSR 2

Dear Ms. McClung:

On behalf of Appalachian Power, I am filing comment on the above regulation supporting the comments being presented by the West Virginia Chamber of Commerce on this same regulation. As a member of the Chamber Water Sub-committee, Appalachian Power participated in the development of the Chamber's comments and incorporate their submittal by reference.

We appreciate the opportunity to offer comment on this proposal.

Sincerely,

Timothy P. Mallan
Environmental Affairs Manager
Appalachian Power

West Virginia Farm Bureau

Member of American Farm Bureau Federation

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

July 17, 2006

Lisa McClung, Director
Division of Water and Waste Management
Department of Environmental Protection
601 57th Street, SE
Charleston, West Virginia 25304

Re: Comments to Revisions to Existing Legislative Rules: 47CSR2

Dear Ms. McClung:

The West Virginia Farm Bureau is filing these comments regarding the addition of 337 streams to Appendix A of the proposed 47 CSR 2 that includes the list of "trout waters".

The West Virginia Farm Bureau is the largest agricultural organization in West Virginia representing nearly 14,000 families.

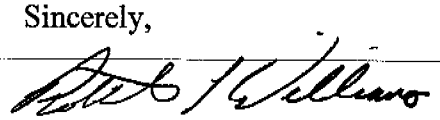
We believe the expansion of the "trout waters" list is inappropriate without substantial additional study and data collection. Trout waters are defined in the rule as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but do not support year-round populations." Your "Briefing Document" states that this would be verified when multiple year classes, including young of the year are collected during surveys.

Much of the data you use simply does not support this definition, but you proceed with the listing. How can this be justified? Many of the surveys conducted by DNR are dated in the 1980's. I doubt that WVDEP would accept such data if it were submitted to them on a permit application from a citizen. Much of it does not positively address the requirement of natural reproduction as defined in the "Briefing Document". Many of the streams have received only one survey several years or even decades ago. This is not sufficient data to list a stream. The reliance on a single "snapshot" of the stream seems inadequate in light of WVDEP requirements for other water quality programs. We believe that streams should not be listed as trout waters without first establishing that the stream is **currently** capable of supporting a year-round trout population. Where more complete surveys do not exist, the stream should not be added to Appendix A until they are completed.

The massive expansion of the "trout waters" list without input from the areas most affected also seems to be inappropriate. Landowners in the most affected region are likely not aware that they are on the verge of losing more of their private property rights to government regulation. We encourage WVDEP not to rush expansion of this list without broad public input. Public meetings in Randolph, Tucker, Pendelton and Pocahontas Counties should be held at a minimum.

Thank you for the opportunity to provide these comments.

Sincerely,



Robert L. Williams
Executive Secretary

CC: WVFB Board of Directors

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

Scott G. Mandirola, Assistant Director
Water Quality Stands Program
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, West Virginia 25304

Dear Mr. Mandirola:

On June 2, 2006, the West Virginia Department of Environmental Protection (DEP) began the Public Notice and Comment Period on its proposed changes to West Virginia Requirements Governing Water Quality Standards 47CSR2. This proposed rule resulted from the State's triennial review of water quality standards (WQS) as required Section 301(c)(1) of the Clean Water Act (CWA).

EPA appreciates the opportunity to provide comments for your consideration on the proposed changes to West Virginia WQS. We are pleased with the number of clarifications in the numeric criteria Table 1 in Appendix E and removal of the expired site-specific numeric criteria, variances and use removes in Section 2.7. Our comments on the proposed rule are contained in Enclosure 1.

Please note that the comments and questions in the enclosure, regarding either existing or proposed water quality standards, are preliminary in nature and do not constitute a disapproval or determination by EPA under Clean Water Act Section 303(c). Approval/disapproval decisions will be made by the Region following adoption of new/revised standards by the state/tribe and submittal to EPA. Any determination pursuant to Clean Water Act Section 304(c)(4)(B) may only be made by the Administrator.

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

Sincerely,

Cheryl Atkinson

Cheryl Atkinson, WQS Coordinator
Office of Standards, Assessment, & Information Management

Enclosure

Section 2.2. Definitions

This section defines "cool water lakes" as lakes managed by the West Virginia Division of Natural Resources (WVDNR) for cool water fisheries, with summer residence times greater then 14 days. EPA supports West Virginia adopting a definition for cool water lakes; however, the definition provided simply references the lakes managed by WVDNR, without actually defining a cool water lake. What is WVDNR's definition of cool water lakes? EPA recommends that ~~West Virginia more precisely define cool water lakes, with reference to the aquatic life~~ communities that are supported in those waters or the physical conditions that define those lakes. In addition EPA recommends that West Virginia add a warm water lake definition for clarity.

Concerning the14-day residence time, please explain how West Virginia calculates and applies the 14-day residence time. The information should discuss whether the residence time is adjusted to account for seasonal variation in tributary discharge, and whether a residence time has been calculated with respect to differences in residence time of the epilimnion and hypolimnion during summer stratification (when it develops). This information will assist in providing support for the lake water classification and on how the proposed criteria protect those classifications.

Section 8.3. Criteria for Nutrients in Lakes

This section establishes nutrient criteria designed to protect Water Use Categories B (Propagation and Maintenance of Fish and Other Aquatic Life) and Categories C (Water Contact Recreation). Section 8.3.b sets forth the numeric criteria for nutrients (based on an average of four or more samples collected during the period May 1-October 31) as follows:

Total phosphorus shall not exceed:

- 50 ug/l for warm water lakes
- 30 ug/l for cool water lakes

Chlorophyll-a shall not exceed:

- 30 ug/l for warm water lakes
- 15 ug/l for cool water lakes

For both total phosphorus and chlorophyll-a West Virginia states that in lieu of sampling, impairment may be evidenced at any time by noncompliance with section 3.2, as determined by the Secretary.

EPA reminds West Virginia that water quality criteria must be based on a sound scientific rationale and must contain sufficient parameters to protect the designated use(s). West Virginia's submission for approval to EPA of adopted nutrient criteria should include documentation of that rationale and the methodology used to develop the criteria for nutrients in lakes.

In addition, EPA has the following specific questions and comments:

- Please provide rationale showing how total phosphorus criteria of 50 ug/l for warm water lakes and 30 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria.

- Please provide rationale showing how chlorophyll-a criteria of 30 ug/l for warm water lakes and 15 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria.

- The rationale should include an analysis to show that the criteria are protective against "worst case" conditions (i.e., hot summers with low flow).

- West Virginia should show how the total phosphorous and chlorophyll-a proposed criteria relate to the Trophic State Index scale of eutrophication. Please also show how the expected levels of chlorophyll-a correlate, if at all, to the expected levels of total phosphorus, and how this correlation is reflected in the criteria..

- The proposed regulations state that the criteria protect water use categories B and C. Will these criteria also protect other uses from the impact of nutrients? If not, how does West Virginia intend to adequately protect the other uses from nutrients? Does West Virginia plan to adopt additional criteria in the future?

- Do all of the lakes in Appendix F have a residence time greater than 14 days? If not, or if for some reason the residence time decreases, do the criteria still apply?

- In addition to providing a list of all cool water lakes, West Virginia should provide a list of all warm water lakes, to more clearly specify the particular waters subject to criteria

- EPA's regulations at CFR Part 131.10(b) require that in "designating uses of a waterbody and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." How do the proposed criteria account for downstream effects?

- Please explain how the proposed nutrient criteria will be protective against the degradation of more pristine lakes with much lower level of nutrients.

- Please explain why a determination of whether a water segment meets the criteria should depend on an average of at least four sample, instead of simply on one sample, or the average of the samples actually taken. How is the sampling procedure establish in the rule protective of the designated uses?

- Does West Virginia expect to sample all lakes more than four times within the index period? If not, what would trigger additional sampling to determine compliance with the WQS?

- Please explain how the criteria will be assessed to determined impairment for the purpose of the Section 303(d) list.

- EPA supports the language in the proposed regulations which explicitly provides that impairment for nutrients also can be determined based on the application of narrative criteria. EPA recommends that West Virginia further define impairment from nutrient by specifying that in the case of nutrients, a water would be deemed impaired if the nutrients have directly or indirectly caused: nuisance algae or excessive growth of macrophytes; unacceptable water clarity, odor or microbial growth; or an increase or decrease in the relative abundance of species or in the diversity of indigenous communities beyond the normal range.

- EPA's recommended parameters for nutrient assessment are total phosphorus, total nitrogen, chlorophyll-a, and some measure of water clarity." Please explain and support West Virginia's rationale for not proposing total nitrogen and secchi nutrient criteria for lakes.

Section 7.2.d.16.2

This section extends the socioeconomic variance until July 1, 2008. EPA reminds West Virginia that documentation in support of the extension of this variance should show that the conditions for granting a variance still apply and that the variance provisions are consistent with 40 CFR 131.10(g). Discharger-specific variances based on the substantial and widespread economic and social economic impact factors should include a demonstration that alternative control strategies were evaluated as part of the showing that standards were not attainable.

Section 9.4

This section references documents outlining methodologies to conduct bioassay testing. EPA has issued new versions of the two EPA documents listed in this section. EPA recommends that West Virginia amend its regulations to cite the most recent versions. The new documents are:

-Methods for Measuring Acute Toxicity (EPA-821-R-02-012, October 2002, 5th Edition)

-Short Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013, October 2002, 4th Edition).

Appendix A Category B-2 Trout Waters

West Virginia has deleted a number of streams from the trout water list. EPA reminds West Virginia that States may remove a designated use which is not an existing use, as defined in Section 131.3, if the State can demonstrate that attaining the designated use is not feasible. West Virginia's submission for approval should include a use attainability analysis (UAA) covering each stream or stream segment that is being removed from the trout list. As defined in the water quality standards regulations, a UAA is a structured scientific assessment of factors affecting the attainment of a use, which may include physical, chemical and biological and economic factors. 40 C.F.R. 131.3(g). EPA notes that this assessment can be simple or complex, depending on the water body in question and the reason for the removal of the use. For streams that may have been erroneously designated as trout streams, a UAA could consist of data showing that the natural conditions (such as physical and chemical conditions) that prevent the water body from sustaining a year-round trout population have been present all along, and that those conditions are not subject to change.

Coordination with the U.S. Fish and Wildlife Service (FWS)

In February of 2001, EPA entered into a Memorandum of Agreement (MOA) with the FWS and the National Marine Fisheries Service (NMFS) regarding coordination under the CWA and the Endangered Species Act (ESA). Section 7 of the ESA requires that all Federal agencies ensure that any covered action, (including any approval or disapproval action under CWA Section 303(c)) is not likely to jeopardize the continued existence of any threatened or endangered species, or to result in the destruction or adverse modification of the habitat that has been designated as critical for species.

We would appreciate your cooperation in meeting the spirit of these commitments under the MOA in order to expedite our 303(c) action once revisions to West Virginia's WQS rule are submitted for our review. While we recognize that this MOA does not bind the state, dischargers, construction projects and others who are individually responsible for compliance with the Endangered Species Act. West Virginia can assist EPA in meeting our commitment by facilitating early exchange of information with the FWS and helping in early identification of potential problems. This effort can contribute to a speedier review by EPA and decrease the likelihood of a nonoccurrence by FWS on an action to approve any newly adopted criteria.

WestVirginiaUniversity
Davis College of Agriculture, Forestry and Consumer Sciences

July 13, 2006

Lisa McClung, Director
WVDEP DWWM
601 57th Street S.E.
Charleston, WV 25304

RE: Comment on proposed 47 CSR 2, Requirements Governing Water Quality Standards

Dear Ms. McClung:

As you are aware, I chaired the Nutrient Criteria Committee which was formed by the Environmental Quality Board in 2002 and continued meeting through 2006 under the supervision of the West Virginia Department of Environmental Protection. As you are also aware, the committee reached a consensus on new criteria for lakes and reservoirs for phosphorus and chlorophyll-a, and announced this consensus at WVDEP's public meeting on water quality standards on April 28. This consensus is accurately represented in the current draft rule.

Thank you for taking the hard work of the Committee seriously. I urge the WVDEP to preserve the nutrient-related language in the current rule and to continue your efforts to ultimately gain approval from the legislature and the United States Environmental Protection Agency.

Sincerely,

Tom Brand
Nutrient Criteria Committee Chair

WV Agricultural and Forestry Experiment Station
Office of the Dean and Director

Phone: 304-293-2395
Fax: 304-293-3740
www.cafcs.wvu.edu

1170 Agricultural Sciences
PO Box 6108
Morgantown, WV 26506-6108

COMMENTS OF THE

WEST VIRGINIA MANUFACTURERS ASSOCIATION

AND THE

WEST VIRGINIA OIL & NATURAL GAS ASSOCIATION

REGARDING

REQUIREMENTS GOVERNING WATER QUALITY STANDARDS

47 C.S.R. 2

July 17, 2006

I. INTRODUCTION.

The West Virginia Manufacturers Association (WVMA) is a trade association composed of manufacturers and related businesses that are dedicated to the advancement of manufacturing activities in West Virginia. The WVMA regularly comments upon rules of interest to its members. It is particularly concerned about West Virginia's water quality standards and their effect on West Virginia businesses, and offers the following comments on changes to those standards that have been proposed by the West Virginia Department of Environmental Protection (DEP).

The West Virginia Oil & Natural Gas Association ("WVONGA"), chartered in 1915, is one of the oldest trade associations in West Virginia, serving the entire oil and gas industry. WVONGA members are engaged in exploration, production, gathering, processing, transmission, storage, sales and distribution of natural gas. WVONGA's members employ thousands of people across the state, own about 20,000 oil and gas wells, and have thousands of miles of natural gas pipelines across the state.

II. COMMENTS.

A. Definition of cool water lakes.

We applaud the members of the Nutrient Criteria Committee that reached consensus on proposed nutrient criteria for lakes. However, we would urge the DEP to clarify which of the two sets of nutrient criteria found in §8.3.b apply to state lakes.

Section 8.3 states that "the following cool water nutrient criteria shall apply to cool water lakes. (See Appendix F for a representative list.) The following warm water nutrient criteria shall apply to all other lakes with a summer residence time greater than 14 days." The rule defines cool water lake as lakes "managed by the West Virginia Division of Natural Resources for cool water fisheries with summer residence times

greater then [sic] 14 days." §2-2.2. These two provisions leave us uncertain as to how one is to distinguish between cool water lakes and warm water lakes. Since the descriptions of cool water and warm water lakes are similar – both have a residence time in the summer greater than 14 days – the difference must be that cool water lakes are those managed as such by the Division of Natural Resources (DNR). However, since there is no reference to where the DNR keeps that list, it is impossible to know what lakes are managed as cool water lakes. There is a "representative list" of cool water lakes in Appendix F, but it is not exclusive of any other lakes that meet the definition in §2.2.

The DEP should develop a complete list (not a representative list) of cool water lakes managed by the DNR and place it in Appendix F. If it does not do so, it will be impossible for anyone to be certain whether a lake that is not listed in Appendix F is a cool water lake.

There is another change that we would urge be made to the criteria set out in §8.3.b. The rule should specify that the criteria apply in the hyperlimnion, and compliance samples should be taken in the non-flowing lacustrine zone of the lake. These were the conditions and locations on which the nutrient criteria were predicated, and they should be acknowledged in the rule.

B. Trout streams.

The DEP proposes to designate hundreds of West Virginia streams and rivers on Appendix A as Category B-2 Trout Waters based primarily on a recommendation from the DNR. We believe that many of these streams do not meet the definition of trout waters and therefore should not be designated as such. Furthermore, we are unaware of any technical demonstrations supporting the assertion that the instream water quality of each stream can sustain a "year-round trout population." We urge the DEP to withdraw this proposal and develop a more comprehensive and suitable process for making this and future designations.

The proposal is not supported by fact or law.

The proposed water quality standards define trout waters in Section 2.19 as "waters which sustain year-round trout populations" but specifically exclude "those streams or stream segments which receive annual stockings of trout, but do not

support year-round populations." In its *Statement of Circumstances Which Require Rule* that accompanies the proposed water quality revisions, the DEP explains how it and the DNR collaborated on deciding which streams to list as trout waters. The DEP states that it was given a list of waters that meets the foregoing definition. There was apparently no independent analysis of the streams on that list by the DEP.

We do not believe that the representations of the DNR, no matter how well-intentioned, are sufficient to allow the DEP to perform its task of determining which streams support year-round populations of trout. The Legislature has given the DEP, not the DNR, the responsibility for setting water quality standards, and if it is going to place a list of a trout streams in an appendix to the standards, it should confirm that those streams meet the definition of trout waters. Without that analysis, the state's citizens are unable to determine whether the DEP and the DNR have accurately evaluated the situation.

The only documents justifying the DNR's lists of trout streams that we are aware of are the stream survey sheets prepared by the DNR. These were made available by the DEP, but apparently were not relied upon by the DEP in evaluating the DNR's list. In any event, these surveys provide limited data that should not serve as the basis for making such an important decision as a use determination. Some of the streams are listed as trout waters based on observations of trout in a stream (sometimes 20 to 30 years ago), often on just a single occasion. Some surveys do not report young-of-the-year, or any other basis for considering the stream a trout water. Such data cannot support a finding that trout were present then, or are present now, on a year-round basis.[1] There is a serious disconnect between DNR's listing approach and the definitions specified in the standards.

Waters of sufficient quality to attain the trout water classification are protected by Category B-2 water quality criteria that are generally more restrictive than the Category B-1 criteria applied to warm water fisheries. The one-time or periodic report

[1] The DEP notes, in its *Statement of Circumstances Which Require Rule*, that the list has to include every trout stream where year round trout populations or reproduction have been established since November 28, 1975, because they are existing uses. Given the limited data available, there are insufficient grounds for stating that the B2 use applied at any time in the past, and that it is therefore an existing use. Determining whether the use is present should require much more data than one or two observations, as discussed below.

of trout in a watcr body, or a portion thereof, by the DNR does not mean that it, or that portion, should be reclassified as a cold water fishery subject to the more stringent Category B-2 water quality criteria.

A systematic evaluation of stream reclassification is needed to determine whether a water body is a legitimate trout stream. We recommend that, prior to listing a water in Appendix A, the DEP require a demonstration that the water will "sustain year-round trout populations" in accordance with the §2.19 definition of trout waters. Such a showing should include, at a minimum, multiple reports of seasonal water quantity and quality, as well as biological data that demonstrate that the instream water quality can sustain a "year-round trout population". This approach is consistent with the antidegradation implementation procedures, 60 C.S.R. 5, for nominating and designating Waters of Special Concern and Outstanding National Resource Waters, which require objective classifications based on sound science.

It is important to have a process in place that accurately identifies trout streams, because once a stream is added to an appendix in the water quality standards, it is extremely difficult to remove. In contrast, adding a stream that satisfies the definition is much easier. Furthermore, the cost to the regulated community posed by an incorrectly listed trout stream could be significant, and it is not unreasonable to expect the DEP to expend resources to verify that the listing is accurate.

The DEP should develop alternative trout water classifications.

In addition to improving the data used to determine which streams are trout waters, we urge the DEP to recognize that not all trout waters are of the same quality, and some may not deserve the same level of protection as others. Due to many factors, natural as well as anthropogenic, the quality of West Virginia waters ranges from those streams that can support trout for only a limited portion of the year to those that support "native" trout. In order to reflect this reality the DEP should change the definition of 'trout waters and/or develop appropriate scientifically-based implementation procedures to recognize the following three trout water classifications: (1) waters that sustain stocked trout for a portion of the year, (2) waters that sustain stocked trout year-round and (3) the more ecologically and socially important "native" or "naturally reproducing" trout waters. Since they sustain trout for only a portion of the

year, Classification 1 waters should be protected with Category B-1 water quality criteria. Classification 2 streams would require somewhat more protective criteria than Classification 1 streams because they support trout year-round but do not support propagation. Classification 3 streams should receive Category B-2 criteria protection because they support "native" or naturally reproducing populations.

Both Pennsylvania (Title 25, Chapter 93.3) and Virginia (9 VAC 25-260-370) differentiate seasonally stocked trout waters from the higher classifications of Cold Water Fishes (Pennsylvania) and Wild Natural Trout Streams (Virginia) and apply the appropriate numeric criteria specific to protecting that use. For example, Pennsylvania has a use designation, TSF, which is specific to waters suitable for maintenance of stocked trout for the period from February 15 to July 31. Water quality criteria protective for the TSF use are found in Chapter 93.9 of Title 25 and, in the case of temperature, are clearly different from criteria for the protection of year-round trout fisheries under the Cold Water Fishes (CWF) designated use. Virginia's classification system differentiates between waters suitable for maintenance of wild trout populations (Wild Natural Trout Water) and for the year-round hold-over of stocked trout (Stockable Trout Waters). In Virginia, a stream is considered unsuitable for any type of trout fishery under any of the following conditions (1) summer temperatures are unsuitable for trout survival; (2) the stream contains a significant population of warm water gamefish: (3) insufficient flow; or (4) intolerable water quality. The Virginia and Pennsylvania approaches are pragmatic and enjoy broad-based public support because they recognize the realistic attainability of the use within specific waters and indirectly incorporate both social and economic considerations into the designations.

The Pennsylvania and Virginia approaches are also consistent with an example of properly designating uses contained in EPA's Water Quality Standards Handbook: Second Edition (EPA-823-B-94-005a, August 1994). Section 4.4.2 of the EPA handbook describes a scenario where a stream does not support an existing use as a cold water fishery even though it sustains a small cold water fish population. In this example, the existing stream temperatures are unsuitable for a thriving cold water fishery, with only a small marginal population. EPA states that under this type of situation "[a]

use attainability analysis or other scientific assessment should be used to determine whether the aquatic life population is in fact an artifact or is a stable population requiring water quality protection."

We believe that adopting the DEP's proposed list of trout waters will result in the incorrect designation of many streams, which could yield serious socioeconomic impacts. In light of the above, we recommend that the DEP withdraw its current proposal to modify the Appendix A list. We also recommend that West Virginia develop a more comprehensive process for determining whether the characteristics of water are adequate to support the B-2 trout waters use and that this process be used in developing subsequent listing proposals.

C. Aluminum Criterion

We support the DEP's proposed modification of the chronic criterion for aluminum from 87 ug/l to 750 ug/l for all waters except trout waters. As the EPA has acknowledged, this change is consistent with the Clean Water Act and water quality standards program requirements in 40 C.F.R. Part 131. The EPA has already approved the modification on a temporary basis, but made it clear in Jon Capacasa's January 9, 2006 to Director McClung that "EPA's approval of the criteria as modified is based on a finding that the criteria are protective of the aquatic life use regardless of whether they apply temporarily or permanently." The DEP's action in adopting the EPA's conclusions and proposing to make the criterion change permanent is scientifically supportable and reasonable.

D. Use Classifications.

The WVMA believes that this triennial review of water quality standards presents an opportunity for the DEP to clarify its policy for determining which water quality uses apply in state waters. Determining which uses exist, and therefore what criteria apply, has a significant effect on how water quality standards are implemented in permits and development of total maximum daily loads. We urge the DEP to amend its practices by determining, on a case-by-case basis, where uses apply, so that permits can be better written.

Currently, the DEP assumes that all uses described in Section 6 of the water quality standards apply in all waters, whether that is correct or not. The effect is to

greatly increase the burden on industries in the course of permitting, and increase the likelihood that water bodies will be found to be in violation of water quality standards. For example, even if a stream is not used for irrigation activities, permit writers must set limits as if it were. Streams that are too small to serve as Category A public water supplies must still be protected as drinking water sources, even though they are often dry, and have never been used as a water supply. To avoid having permit limits based on the criteria for a use that has never existed, the permittee must go through the process of removing the use, or seeking a determination that the use does not apply. In either event, the permittee must petition the agency for a change in water quality standards, obtain approval for the change from the West Virginia Legislature, and wait years for EPA to approve the change before it becomes final. Only then can the permit be revised.

Examples of this situation crop up regularly. The DEP was involved in a lengthy process, which required years of negotiation and amendment of the West Virginia Water Pollution Control Act, before many mine discharges could be relieved of the requirement of meeting the Category A criteria for manganese. All those involved acknowledged that treating for manganese often presented more problems than the manganese itself, but the DEP's approach to water quality standards implementation delayed a resolution that was cost-effective and still environmentally protective. In recent years, the issue has arisen for Dow Chemical Company and Huntington Alloys, which discharge into Ward Hollow and Pats Branch, respectively. In each of these two situations, the Category A use clearly does not apply, as there is no public drinking water supply even possible in the streams. Nevertheless, the affected companies have had to go to great expense to request changes to the water quality standards in order to clarify that the Category A use does not apply in those locations. The effect of the DEP's position is to cause businesses to spend inordinate amounts of money and time obtaining approval for changes to the water quality standards, first from the state and then from EPA, to address a situation that presented no environmental harm in the first place.

This is a situation that could be improved by a simple change in the way the DEP writes NPDES permits. If at the time a permit is written the permit writer identified which water uses applied, and what criteria would be used to set water quality-based permit limits, the permittee would have the opportunity to show to the permit writer's

satisfaction that a certain use did not apply. That might be done by, for example, showing that there was insufficient flow for a water body to serve as an irrigation source, or public water supply. The permit still would be drafted to protect those uses that were present, and the public and the permittee would have ample opportunity to comment on the permit at the time it is issued, and could appeal the permit if they were dissatisfied with the uses that were deemed to be existing. That appeal could be taken up to the West Virginia Supreme Court of Appeals, if necessary. Anyone unhappy with that result could ask the DEP or the Legislature to approve a change to the water quality standards to remove or impose the use. In short, there would be plenty of opportunity for the public to weigh in on the applicable uses, the permit writer's decision would be reviewed every time the permit was renewed, and limits would be set in a rational fashion.

Unless the DEP alters its approach, the permittee must convince the DEP to propose a rule change, get the Legislature to approve that rule change, and wait several years for EPA to act on the change of standards. The DEP has made this far more difficult than it needs to be, and a simple change of policy could make permit issuance much easier for all concerned. We urge the DEP to implement that policy change without delay.

E. The DEP did not adequately consider economic impacts.

The DEP is required by law to evaluate the economic effects of this proposal. There are two independent requirements for doing so. First, all legislative rules must include a fiscal note "and a statement of the economic impact of the rule on the state or its residents." See *W. Va. Code* §29A-3-4(b), made applicable to legislative rules by *W. Va. Code* §29A-3-9. The second requirement is found in *W. Va. Code* §§22-11-2, which requires that the DEP establish water quality standards that are consistent with "the expansion of employment opportunities, maintenance and expansion of agriculture and the provision of a permanent foundation for healthy industrial development." Therefore, an economic analysis of this proposal should have been developed and made available for comment by interested and affected parties.

The fiscal note attached to the DEP's proposal is inadequate because it states that "[n]o fiscal impacts on state government are anticipated," without considering whether there are costs that will be imposed on state residents, lost (or gained)

employment opportunities, and other effects. Some of the changes the DEP has proposed, such as the revision to the chronic aluminum criterion, may result in a positive fiscal impact, as unnecessary permit limits are avoided. Other changes, such as the addition of streams to the trout waters list or the development of nutrient criteria, may result in greater compliance costs, and this should be estimated and provided to the Legislature.

We understand that these costs may be difficult to quantify with precision, but the Legislature has required the analysis in order to better weigh the effect of rules on state citizens. We urge the DEP to undertake this exercise before it files its final rule.

III. CONCLUSION

We appreciate the opportunity to provide comments on the proposed changes to the West Virginia water quality standards. We hope they will be given careful consideration.

Karen S. Price, President
West Virginia Manufacturers Association

Nicholas DeMarco
West Virginia Oil & Natural Gas Association

From: "Steve Keen" <sckeen@brightwv.com>
To: "Scott G. Mandirola" <smandirola@wvdep.org>
Date: 7/17/2006 3:59:39 PM
Subject: Comments on Proposed 47CSR2 Revisions

Mr. Mandirola:

Please accept the attached comments on behalf of Bright Enterprises and pertaining to the proposed revisions to 47CSR2. A "hard copy" will follow via US Postal Service.

Thanks you for providing this comment opportunity.

Stephen C. Keen, P.E.
Vice President - Engineering
Bright Enterprises
P.O. Box 460
200 Greenbrier Road
Summersville, WV 26651

Phone: 304-872-3000, Ext. 241
Fax: 304-872-3040

Bright Enterprises

200 Greenbrier Rd., P. O. Box 460, Summersville, West Virginia 26651
Phone: 304/872-3000 Fax: 304/872-3040

July 17, 2006

RECEIVED

JUL 17 2006

WATER QUALITY STDS

Scott G. Mandirola, Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Via e-mail

Subject: Comments Regarding Proposed Revisions to Existing Legislative Rules 47 CSR 2

Dear Mr. Mandirola:

Bright Enterprises is a Summersville, WV, based business group with interests in energy, travel and tourism, transportation, residential development, timber and timberlands, and other businesses. We own or have interests in properties and projects throughout West Virginia, and we are always concerned about regulatory proposals that would affect those business and property interests, and which would further affect the overall economic progress of our State.

We believe that certain elements of the currently proposed changes to 47 CSR 2, specifically but not necessarily limited to the proposed addition of 337 streams to the Appendix A list of known "trout waters", will have negative effects on the development and use of our properties and on our ongoing and planned businesses.

We also believe this dramatic expansion of listed "trout waters" is a major public policy issue for the State, and frankly one whose intent and implications appear not to have been adequately analyzed, considered, or explained by DEP. Speaking from our viewpoint, we feel quite in the dark about DEP's public policy intent for this proposal, but we foresee it to have significant consequences whether or not that is the agency's intent. Accordingly, we believe the proposal to designate these "trout waters" by listing them in Appendix A to 47 CSR 2 is premature, and should be withdrawn and reconsidered. Our rationale and additional information follows.

First, our companies are among the thousands of businesses represented by the West Virginia Chamber of Commerce (the Chamber). The Chamber has prepared and will today (July 17th) be filing comments on the proposed revisions to 47 CSR 2, including the proposed "trout waters" list expansion as well as other elements of the current proposal. We support and agree with the Chamber's comments, and ask that you consider the Chamber comments to be incorporated herein by reference. However, we would like to add certain specific observations and questions beyond those offered by the Chamber.

According to information provided by your agency, the current list includes 160 streams and/or lakes, and the new list as proposed will include 492 streams and lakes, more than tripling the number so designated. During the April 28, 2006, public information meeting at DEP headquarters agency representatives pointed out that even the list of 492 water bodies is "not definitive", and that the agency envisions that hundreds more streams might later be added.

Many of these same streams were proposed by DEP to be listed as Tier 2.5 streams pursuant to another ongoing but still pending regulatory action, specifically the Antidegradation Implementation Procedures (AIP) Rules. When we and others reviewed the data offered by DEP (including the WVDNR data) in support of the proposed Tier 2.5 stream designations, it was readily apparent that for many streams the data were extremely limited, and years or even decades out of date. By reasonable scientific standards such data were and are not adequate for significant regulatory decisions, and comments to that effect were offered in the context of the AIP.

Under the AIP, DEP and affected parties are still facing administrative and judicial appeals, as well as final consideration by the Legislature before any of the proposed Tier 2.5 stream designations are finalized. Because the data deficiency is one of the major objections to proposed Tier 2.5 listings, it was to say the least surprising when DEP published its intent to add the same streams (and many more) to the Appendix A "trout waters" list, based on what is apparently the same data. It seems that prudence would have dictated that the AIP review of the sufficiency of such data should have been allowed to run its course before DEP made another major regulatory proposal based on the same data.

As part of the AIP process our companies specifically objected to Tier 2.5 listing of the following streams, on the basis of concerns about the effect of such listing on our properties and businesses, but also because we believed the data (including trout data) cited by DEP pertaining to the streams were inadequate and scientifically deficient:

Big Run of Red Creek of Dry Fork, Randolph County (MC-60-O-1)
Red Creek of Dry Fork, Tucker and Randolph Counties (MC-60-O)
Dry Fork, Tucker County (MC-60)
Spruce Run of Dry Fork, Randolph County (MC-60-P)
Difficult Creek of North Branch Potomac River, Grant County (PNB - 18)
Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB - 16 - B)
Wycroff Run of Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB - 16 - B - 1)
Glade Creek of (Lower) New River, Raleigh County (KN - 29)
Pinch Creek of Glade Creek of (Lower) New River, Raleigh County (KN - 29 - E)
Rockcamp Run of Buffalo Creek of Elk River, Clay County (KE-50-I)
Piney Creek of (Lower) New River, Raleigh County (KN-26)

Each of these streams is now on your proposed Appendix A "trout waters" list. Whether or not the data are adequate to identify any or all of these or any streams as "trout waters", however, there are other concerns that we believe should have been and must be addressed by the agency before pursuing this "trout waters" list expansion.

Your "Briefing Document" for the proposed 47 CSR 2 changes includes a section entitled "Statement of Circumstances Which Require Rule". As one reads the portion of this section pertaining to the "trout waters" list, one sees that it fails to identify anything that could be construed as a "requirement". To our knowledge there is in fact no federal or other mandate compelling West Virginia to specially identify "trout waters" or to afford them protections in excess of those standards and limitations which are adequate for other streams.

We suggest that since the decision to so identify streams and lakes is one that is left to the State, then the State's implementing and rulemaking authority, DEP, owes it to the public and to affected property owners, local governments, and businesses to explain why this is appropriate and sound public policy. DEP should consider and define the public policy purposes and implications of "trout waters" listings, and clearly communicate such to affected parties and to the general public. If the current rule does not correctly reflect the State's public policy intent, appropriate modifications should be considered to correctly focus the intent of "trout waters" listings and to protect against unintended consequences.

We understand that the concept of "trout waters" as a stream use, along with additional protections for such waters, has existed in the West Virginia Water Quality Standards (WQS) for many years or even for decades. During that period, however, there have been myriad changes in permitting requirements, enforcement procedures, public participation processes, and other elements of the State's programs for protection of water quality and uses. Accordingly, it is our belief that the current day effect and implications of a stream being listed as a "trout water" are likely far different from those envisioned and intended when the concept was first incorporated into the WQS.

One of the most significant changes to the State's WQS program, and one that is clearly linked to the concept of "trout waters" is the 2001 Antidegradation Implementation Procedures (AIP) legislative rules, already discussed above. We frankly expect that a listing as an Appendix A "trout water" will eventually be used, as an alleged validation of the underlying trout data, to support back door attempts to regulate such streams under Tier 2.5 antidegradation standards. If this is not the intent of DEP, then the agency should correct its current proposal and process regarding "trout waters" listings so as to assure that such unintended consequences do not take place.

Next, DEP should consider that streams containing year round populations of trout (if in fact they do) are clearly not all equal. In the media much has been made of the economic benefits of trout fisheries. Through our travel and tourism interests we see that benefit, and support its

continuation and enhancement. However, it is obvious that many of the streams in question have not served and never will serve as fisheries.

Many of the streams on the proposed "trout waters" list are physically too small to serve as viable fisheries. Further, the full lengths of many of these streams, and much of the length of many others, are located entirely within private properties and are not legally accessible for fishing, whether or not they are physically fishable.

If the intent of listing streams as "trout waters" is to protect the economic benefit to the State of such fisheries, then streams or segments that factually do not serve as fisheries should not be listed. In such case perhaps the "trout waters" definition should be clarified to indicate that it pertains only to those streams which support year round populations of trout, and which by their physical size and nature, location, and access opportunities do in fact serve as trout fisheries.

On the other hand, if DEP sees it as appropriate to afford special protections to streams supporting year round trout populations "just because they are there", with no regard for the ancillary impacts of such designations, then DEP should explain its rationale as such.

If DEP believes that streams containing trout need to be protected as such on the basis of some perceived "public right" to such streams, regardless of the ownership of the lands within which such streams lie, DEP needs to communicate that intent to the public, and more importantly to taxpaying landowners.

If the public policy intent of a "trout waters" list is to control, decrease or prevent private property development along such streams, or if that is the inevitable outcome (as we strongly believe will be the case) then DEP needs to clearly tell the public that such is intended or that such will be a likely if unintended outcome.

Whatever the rationale behind DEP's decision to retain the "trout waters" concept, and to drastically expand its application by tripling the list of such waters, the public needs and deserves to have that rationale clearly described by WVDEP. We believe this is a very important public policy issue, and no matter how long the "trout waters" concept may have existed in the State's WQS, it should not be automatically perpetuated and expanded by DEP without the agency first thinking through and explaining why it believes this is the right thing to do from the public policy standpoint.

Simply put, what purposes is DEP trying to achieve, and what consequences does DEP intend and envision from identifying streams as "trout waters"? If upon thorough consideration DEP determines that the existing rules and definitions pertaining to "trout waters" do not correctly reflect appropriate public policy purposes, and that unintended consequences are therefore likely, the rules need to be corrected. Until such consideration is completed and clearly

stated by DEP to all interested parties, there should be no streams added to Appendix A. The public deserves to first know why DEP believes such action is appropriate, and what public policy purposes it is trying to achieve.

Sincerely Yours,

Stephen C. Keen

Stephen C. Keen, PE
Vice President - Engineering

From: <Atkinson.Cheryl@epamail.epa.gov>
To: <SMANDIROLA@wvdep.org>
Date: 7/17/2006 2:26:30 PM
Subject: Comments on the Proposed WQS Triennial Rule

Dear Scott

On June 2, 2006, the West Virginia Department of Environmental Protection (DEP) began the Public Notice and Comment Period on its proposed changes to West Virginia Requirements Governing Water Quality Standards 47CSR2. This proposed rule resulted from the State's triennial review of water quality standards (WQS) as required Section 301(c)(1) of the Clean Water Act (CWA). EPA appreciates the opportunity to provide comments for your consideration on the proposed changes to West Virginia WQS. We are pleased with the number of clarifications in the numeric criteria Table 1 in Appendix E and removal of the expired site-specific numeric criteria, variances and use removes in Section 2.7. Our comments on the proposed rule are listed below.

Please note that the comments and questions listed below, regarding either existing or proposed water quality standards, are preliminary in nature and do not constitute a disapproval or determination by EPA under Clean Water Act § 303(c). Approval/disapproval decisions will be made by the Region following adoption of new/revised standards by the state/tribe and submittal to EPA. Any determination pursuant to Clean Water Act § 304(c)(4)(B) may only be made by the Administrator.

Section 2.2. Definitions

This section defines "cool water lakes" as lakes managed by the West Virginia Division of Natural Resources (WVDNR) for cool water fisheries, with summer residence times greater then 14 days. EPA supports West Virginia adopting a definition for cool water lakes; however, the definition provided simply references the lakes managed by WVDNR, without actually defining a cool water lake. What is WVDNR's definition of cool water lakes? EPA recommends that West Virginia more precisely define cool water lakes, with reference to the aquatic life communities that are supported in those waters or the physical conditions that define those lakes. In addition EPA recommends that West Virginia add a warm water lake definition for clarity.

Concerning the14-day residence time, please explain how West Virginia calculates and applies the 14-day residence time. The information should discuss whether the residence time is adjusted to account for seasonal variation in tributary discharge, and whether a residence time has been calculated with respect to differences in residence time of the epilimnion and hypolimnion during summer stratification (when it develops). This information will assist in providing support for the lake water classification and on how the proposed criteria protect those classifications.

Section 8.3. Criteria for Nutrients in Lakes

This section establishes nutrient criteria designed to protect Water Use

Categories B (Propagation and Maintenance of Fish and Other Aquatic Life) and Categories C (Water Contact Recreation). Section 8.3.b sets forth the numeric criteria for nutrients (based on an average of four or more samples collected during the period May 1-October 31) as follows:

Total phosphorus shall not exceed:

- 50 ug/l for warm water lakes
- 30 ug/l for cool water lakes

Chlorophyll-a shall not exceed:

- 30 ug/l for warm water lakes
- 15 ug/l for cool water lakes

For both total phosphorus and chlorophyll-a West Virginia states that in lieu of sampling, impairment may be evidenced at any time by noncompliance with section 3.2, as determined by the Secretary.

EPA reminds West Virginia that water quality criteria must be based on a sound scientific rationale and must contain sufficient parameters to protect the designated use(s). West Virginia's submission for approval to EPA of adopted nutrient criteria should include documentation of that rationale and the methodology used to develop the criteria for nutrients in lakes.

In addition, EPA has the following specific questions and comments:

- Please provide rationale showing how total phosphorus criteria of 50 ug/l for warm water lakes and 30 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria.

- Please provide rationale showing how chlorophyll-a criteria of 30 ug/l for warm water lakes and 15 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria.

- The rationale should include an analysis to show that the criteria are protective against "worst case" conditions (i.e., hot summers with low flow).

- West Virginia should show how the total phosphorous and chlorophyll-a proposed criteria relate to the Trophic State Index scale of eutrophication. Please also show how the expected levels of chlorophyll-a correlate, if at all, to the expected levels of total phosphorus, and how this correlation is reflected in the criteria..

- The proposed regulations state that the criteria protect water use categories B and C. Will these criteria also protect other uses from the impact of nutrients? If not, how does West Virginia intend to adequately protect the other uses from nutrients? Does West Virginia plan to adopt additional criteria in the future?

· Do all of the lakes in Appendix F have a residence time greater than 14 days? If not, or if for some reason the residence time decreases, do the criteria still apply?

· In addition to providing a list of all cool water lakes, West Virginia should provide a list of all warm water lakes, to more clearly specify the particular waters subject to criteria

· EPA's regulations at CFR Part 131.10(b) require that in "designating uses of a waterbody and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." How do the proposed criteria account for downstream effects?

· Please explain how the proposed nutrient criteria will be protective against the degradation of more pristine lakes with much lower level of nutrients.

· Please explain why a determination of whether a water segment meets the criteria should depend on an average of at least four sample, instead of simply on one sample, or the average of the samples actually taken. How is the sampling procedure establish in the rule protective of the designated uses?

· Does West Virginia expect to sample all lakes more than four times within the index period? If not, what would trigger additional sampling to determine compliance with the WQS?

· Please explain how the criteria will be assessed to determined impairment for the purpose of the Section 303(d) list.

· EPA supports the language in the proposed regulations which explicitly provides that impairment for nutrients also can be determined based on the application of narrative criteria. EPA recommends that West Virginia further define impairment from nutrient by specifying that in the case of nutrients, a water would be deemed impaired if the nutrients have directly or indirectly caused: nuisance algae or excessive growth of macrophytes; unacceptable water clarity, odor or microbial growth; or an increase or decrease in the relative abundance of species or in the diversity of indigenous communities beyond the normal range.

· EPA's recommended parameters for nutrient assessment are total phosphorus, total nitrogen, chlorophyll-a, and some measure of water clarity." Please explain and support West Virginia's rationale for not proposing total nitrogen and secchi nutrient criteria for lakes.

Section 7.2.d.16.2

This section extends the socioeconomic variance until July 1, 2008. EPA reminds West Virginia that documentation in support of the extension of this variance should show that the conditions for granting a variance

still apply and that the variance provisions are consistent with 40 CFR 131.10(g). Discharger-specific variances based on the substantial and widespread economic and social economic impact factors should include a demonstration that alternative control strategies were evaluated as part of the showing that standards were not attainable.

Section 9.4

This section references documents outlining methodologies to conduct bioassay testing. EPA has issued new versions of the two EPA documents listed in this section. EPA recommends that West Virginia amend its regulations to cite the most recent versions. The new documents are:

-Methods for Measuring Acute Toxicity (EPA-821-R-02-012, October 2002, 5th Edition)

-Short Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013, October 2002, 4th Edition).

Appendix A Category B-2 Trout Waters

West Virginia has deleted a number of streams from the trout water list. EPA reminds West Virginia that States may remove a designated use which is not an existing use, as defined in Section 131.3, if the State can demonstrate that attaining the designated use is not feasible. West Virginia's submission for approval should include a use attainability analysis (UAA) covering each stream or stream segment that is being removed from the trout list. As defined in the water quality standards regulations, a UAA is a structured scientific assessment of factors affecting the attainment of a use, which may include physical, chemical and biological and economic factors. 40 C.F.R. 131.3(g). EPA notes that this assessment can be simple or complex, depending on the water body in question and the reason for the removal of the use. For streams that may have been erroneously designated as trout streams, a UAA could consist of data showing that the natural conditions (such as physical and chemical conditions) that prevent the water body from sustaining a year-round trout population have been present all along, and that those conditions are not subject to change.

Coordination with the U.S. Fish and Wildlife Service (FWS)

In February of 2001, EPA entered into a Memorandum of Agreement (MOA) with the FWS and the National Marine Fisheries Service (NMFS) regarding coordination under the CWA and the Endangered Species Act (ESA). Section 7 of the ESA requires that all Federal agencies ensure that any covered action, (including any approval or disapproval action under CWA Section 303(c)) is not likely to jeopardize the continued existence of any threatened or endangered species, or to result in the destruction or adverse modification of the habitat that has been designated as critical for species.

We would appreciate your cooperation in meeting the spirit of these commitments under the MOA in order to expedite our 303(c) action once

revisions to West Virginia's WQS rule are submitted for our review. While we recognize that this MOA does not bind the state, dischargers, construction projects and others who are individually responsible for compliance with the Endangered Species Act. West Virginia can assist EPA in meeting our commitment by facilitating early exchange of information with the FWS and helping in early identification of potential problems. This effort can contribute to a speedier review by EPA and decrease the likelihood of a nonoccurrence by FWS on an action to approve any newly adopted criteria.

If you have any questions please let me know.

- -
Cheryl Atkinson, U.S. EPA Region III
Phone: (215) 814 3392
- -

CC: <Rivera.Nina@epamail.epa.gov>, <Koroncai.Robert@epamail.epa.gov>

From: <Sammy.Gray@amwater.com>
To: <smandirola@wvdep.org>
Date: 7/17/2006 8:39:10 AM
Subject: Comments on 47-2

West Virginia American Water appreciates the opportunity to comment on the proposed revisions to 47CSR2, "Requirements Governing Water Quality Standards". The company operates nine water treatment facilities and seven purchased water systems serving a population of over 400,000 West Virginians. All of these systems use West Virginia waters for their sources of supply and for these reasons West Virginia American Water continues to be interested in maintaining and improving the quality of the waters of the state. The attached written comments submitted by the company are in reference to Appendix B, not to the body of the proposed rule. Please do not hesitate to contact me if you have questions or if I can be of further assistance in this or any other matter.

Sammy Gray
Government and Regulatory Affairs Manager
VA & WV American Water
1600 Pennsylvania Avenue
Charleston, WV 25302
P: (304) 340-2005
M: (304) 741-7934
sammy.gray@amwater.com

West Virginia American Water
Comments Regarding Proposed Regulations
Title 47
Legislative Rule
Series 2
Requirements Governing Water Quality Standards
Appendix B

West Virginia American Water (WVAW) appreciates the opportunity to comment on the proposed revisions to 47CSR2, "Requirements Governing Water Quality Standards". The Company operates nine water treatment facilities and seven purchased water systems serving a population of over 400,000 West Virginians. All of these systems use West Virginia waters for their sources of supply and for these reasons WVAW continues to be interested in maintaining and improving the quality of the waters of the state. Note: With any expanding economy is the need for additional supplies of clean drinking water.

River basin	County	Operating Company	Source	Changes to be made
Monongahela	Lewis	WV Water-Weston District	West Fork River	Change Operating Company to WV American Water-Weston District
Monongahela	Lewis	West Fork River PSD	West Fork River	Delete
Ohio River/Zone 1	Cabel	Huntington Water Corporation	Ohio River	County misspelled
Kanawha River	Fayette	WV Water-Montgomery	Kanawha River	Change Operating Company to WV American Water-Montgomery District
Coal River	Kanawha	Washington PSD	Coal River	Delete

Coal River	Boone	WV Water-Madison District	Little Coal River	Delete
Coal River	Boone	Van PSD	Pond Fork	Delete
Elk River	Kanawha	WV Water-Kanawha	Elk River	Change Operating Company to WV American Water-Kanawha Valley District
Elk River	Braxton	WV Water-Gassaway	Elk River	Change Operating Company to WV American Water-Gassaway District
Elk River	Braxton	WV Water-Sutton District	Elk River	Delete
Elk River	Webster	WV Water-Webster Springs	Elk River	Change Operating Company to WV American Water-Webster Springs District
New River	Fayette	Ames Heights Water	Mill Creek	Delete
New River	Fayette	Ansted Municipal Water	Mill Creek	Delete
New River	Summers	WV American Water-Bluestone Dist	Bluestone Lake	Add to List
New River	Fayette	WV American Water-New River Dist	New River	Add to List
Bluestone River	Summers	Jumping Branch-Nimitz	Mt. Valley Lake	Delete
Bluestone River	Mercer	WV Water Princeton	Impoundment/Brusch	Delete

Bluestone River	Mercer	Lashmeet PSD	Impoundment	Delete
Bluestone River	Mercer	WV Water-Bluefield	Impoundment	Change Operating Company to WV American Water-Bluefield District
Greenbrier River	Summers	WV Water-Hinton	Greenbrier & New Rivers	Delete
Guyandotte River	Cabell	Salt Rock PSD	Guyandotte River	Delete
Guyandotte River	Cabell	Culloden PSD	Indian Fork Creek	Delete
Guyandotte River	Putnam	Lake Washington PSD	Lake Washington	Delete

West Virginia TROUT UNLIMITED
CONSERVE PROTECT RESTORE

July 12, 2006
104 Hillcrest Ave.
Elkview, WV 25071 – 9514

Stott G. Mandirola, Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Dear Mr. Mandirola:

Trout Unlimited supports the current definition of B2 "Trout Streams" as those which sustain year-round trout populations. Do not change this to require trout reproduction in the streams. There are many high quality streams that have year-round populations that have had their trout reproduction potential eliminated by siltation/sedimentation, acid deposition, metal pollutants, etc. These streams need protection to prevent further degradation of this valuable resource.

The streams currently in the B2 List are a good start, but the list is not all inclusive. The definition must continue to allow streams not currently on the list, but known by the DNR and/or the DEP to sustain year-round trout populations, to be managed as B2 streams.

Thank you for your consideration.

Sincerely,

Larry Orr

Larry Orr
Chairman, WV Council of Trout Unlimited
304 965 7185
edhorse@charter.net

west virginia department of environmental protection

Water and Waste Management
601 57th Street SE
Charleston, WV 25304
(304) 926-0495
Fax: (304) 926-0496

Joe Manchin III, Governor
Stephanie R. Timmermeyer, Cabinet Secretary
www.wvdep.org

September 26, 2005

Ken Roller
North Branch Power Station
2000 Energy Way
Gormania WV 26707

Dear Ken Roller:

I am writing to provide you with the latest information on waters that are being considered for Tier 2.5 protection. §60CSR5, a legislative rule passed in 2001, included Difficult Creek, PNB-18, on the original presumptive list of waters for Tier 2.5 protection. The West Virginia Department of Environmental Protection (DEP) held informational meetings and accepted formal objections on this stream's inclusion on the list.

Since the objections were received, the DEP has reviewed each objection and the information supporting the stream's initial placement on the presumptive list. Fifty streams did not meet the technical listing criteria and are no longer being considered for Tier 2.5 protection.

In a review of Difficult Creek, DEP determined that it met all the technical criteria for Tier 2.5 protection. Further, DEP reviewed the objections received on this stream and, based on the information provided, has made the determination that Difficult Creek should continue to be considered for Tier 2.5 protection.

Please be advised that §60CSR5 section 8.1.a.2, establishes criteria for agency consideration of streams for Tier 2.5 designation. The specific justification for the continued inclusion of Difficult Creek is attached.

A public comment period for all remaining streams designated for Tier 2.5 protection, including Difficult Creek, has been established from September 28, 2005 through November 30, 2005. The DEP will include all information, comments and objections previously provided by the public as part of the public comment record. The DEP strongly recommends that written comments, especially those regarding impact on private property owners and economic development, be as specific as possible to assist the agency in its consideration of the comments. The factors which the DEP will consider regarding the impact on economic development or on private property owners, include, but are not limited to the following: (1) the investment made in the property for economic development and the percentage of the economic benefit of the

DEP Justification for Continued Inclusion of Difficult Creek, PNB-18

§8.1.a.2.A Impact on private property owners.
General objections were received regarding the following potential impacts:

Concerns regarding the increased cost of applying Best Management Practices and the uncertainty of future stricter regulations on agricultural activities.

Concerns regarding the ability to log, the uncertainty of future Best Management Practices requirements and the potential increased costs associated with future logging operations.

DEP Response: *The designation of a stream for Tier 2.5 protection is intended to prevent significant degradation of the water quality. The designation is not designed to prevent land uses along the stream. Activities such as farming or logging, which are non-point sources of pollution, will be deemed in compliance with the antidegradation requirements with the installation and maintenance of cost effective and reasonable Best Management Practices -- regardless of the stream's level of protection (e.g. Tier 1, Tier 2, Tier 2.5 or Tier 3). The designation of the stream as Tier 2.5 will not affect the requirements for Best Management Practices. The DEP cannot base pending decisions on stream designation on speculation that Best Management Practices may change in the future.*

Concerns relating to the future ability to develop the property in the watershed.

Concerns regarding the possibility of land devaluation due to restricted, or increased cost in, future development.

Concerns that restricting potential future uses constitutes a taking of private property rights.

DEP Response: *The designation of a stream as Tier 2.5 is to prevent significant degradation of the water quality, and is not designed to prevent the development of land in the watershed. The DEP has considered the potential impact on private property owners and has reviewed the objections received regarding future development or land use restrictions. The objections received were very general and failed to provide the DEP with sufficient evidence on which to base a decision to remove the stream from the Tier 2.5 designation. The DEP will continue to consider impacts on private property owners during the public comment process. To assist the DEP in its review, commenters are encouraged to provide as much specificity as possible to demonstrate any claim that the designation would impact use of private property. The factors which the DEP would consider regarding the impact on private property owners include, but are not limited to, the following: (1) the percentage of the economic benefit of the property which will be eliminated due to a Tier 2.5 designation; (2) the investment made in the property; (3) any specific plans for development of*

documented reproducing trout populations. The survey confirming this reproduction was conducted by the West Virginia Division of Natural Resources in 1996 and native brook trout were found.

§8.1.a.2.G Impact on economic development, including demonstrated natural resources. General objections were received regarding the following potential impacts:

Concerns regarding the ability to develop coal reserves and other minerals were raised. Concerns related to the ability to obtain a permit and the potential increased costs of compliance associated with future mining permits.

DEP Response: *The designation of a stream for Tier 2.5 protection is to prevent significant degradation of the water quality, and is not designed to prevent eoncomic development or the development of natural resources. The DEP has considered the impact on economic development, including demonstrated natural resources, and has reviewed the objections received to date in opposition to designation of this stream. The objections were very general and failed to provide the DEP with sufficient evidence on which to base a decision to remove the stream from the Tier 2.5 designation. The DEP will continue to consider impacts on economic development during the public comment process. To assist the DEP in its review, commenters are encouraged to provide as much specificity as possible to demonstrate any claim that the designation would impact economic development, including mineral extraction. The factors which the DEP would consider regarding the impact on economic development and natural resource development include, but are not limited to, the following: (1) the investment made in the property for economic development; (2) any specific plans for the economic development of the property; (3) any leases, agreements, or permits which demonstrate plans for development of the property or natural resources; (4) whether use or development of the property will require a water discharge into the designated stream segment or adjacent streams; (5) whether alternatives to prospective discharges into the stream have been evaluated; (6) whether a request for a waste load allocation or a water discharge permit has been submitted to DEP; (7) specific documentation of the existence of natural resources; (8) the specific plans, including timetables, for extraction of the natural resources; (9) explanation and supporting documentation of the difference in impact between a Tier 2 designation and a Tier 2.5 designation.*

Division of Water and Waste Management
1201 Greenbrier Street
Charleston, WV 25311-1088
Telephone Number: (304) 558-2107
Fax Number: (304) 558-5905

West Virginia Department of Environmental Protection

Bob Wise
Governor

Stephanie R. Timmermeyer
Cabinet Secretary

May 27, 2003

Ken Roller
North Branch Power Station
2000 Energy Way
Gormania WV 26707

RE: Tier 2.5 Objection

Dear Ken Roller:

The West Virginia Department of Environmental Protection's (DEP) Division of Water and Waste Management received your objection to the proposed listing of Tier 2.5 streams, under the state Antidegradation rule, in the summer of 2002. As you may recall, the rule presumptively identified 444 streams as waters of special concern requiring protection of existing quality under the state's antidegradation procedures.

The DEP initiated a process, in accordance with the Rule, to allow landowners or those having legal interests in lands adjacent to those streams, to object to the presumptive Tier 2.5 listing. Those objections were due by June 3, 2002.

The DEP has received your objection(s) regarding Difficult Creek (PNB-18). The stream has been presumptively identified as a water of special concern requiring protection under Tier 2.5 of the state's Antidegradation procedures because it met one or more of the following criteria: Reference Stream "no", Trout Stream "yes", High Quality on public land "no". The portion of the stream designated is the entire length - tributary of North Branch Potomac for 5.167557 miles.

All persons that filed objections to a presumptive Tier 2.5 stream listing by June 3, 2002, now have an opportunity to provide additional information in support of their objection. The factors the DEP must consider in deciding whether to grant exemptions are set forth in section 8.1.a.2. of the rule, and generally include:

- Impact on private property owners
- Whether interests of all affected parties have been adequately represented
- Location of the water

- Any previous special designations
- Existing water quality
- Unique or exceptional ecological, recreational or aesthetic resource value
- Impact on economic development in the area, including development of demonstrated natural resources
- Other factors determined by the Environmental Quality Board

If you choose to submit additional information, it should relate to the factors listed above, must be submitted to the Division of Water and Waste Management, 1201 Greenbrier Street, Charleston, WV 25311 Attn: Tier 2.5 Objection, and must be postmarked no later than **July 31, 2003**.

After all objections are evaluated, the DEP's proposed decisions on Tier 2.5 listings will be subject to a 30-day public comment period. Thereafter, any final DEP decision can be appealed to the Environmental Quality Board. Finally, all streams that remain on the presumptive list after the objection process is completed must receive the approval of the State Legislature before becoming final Tier 2.5 streams.

Given the number of steps in this process, as well as the number of objections received, the objection process has been lengthy. DEP thanks you for your patience and appreciates your participation.

The rule and other antidegradation information are available on DEP's web page at http://www.dep.state.wv.us or by calling (800) 654-5227.

Sincerely,

Allyn G. Turner
Director

Pamela F. Faggert
Vice President and Chief Environmental Officer

5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

Dominion™

July 6, 2006

Mr. Scott G. Mandirola
Assistant Director, Water Quality Standards
Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Re: West Virginia List of Trout Waters

Dear Mr. Mandirola:

Virginia Electric and Power Company, a unit of Dominion Resources, Inc. (Dominion), owns and operates North Branch Power Station, a steam electric generating station in Gormania, WV. The power station discharges treated low volume and sanitary wastewater into the headwaters of Difficult Creek, a tributary of the North Branch of the Potomac River.

On July 22, 2003, Dominion provided the West Virginia Department of Environmental Protection (DEP) with comments on the proposed Tier 2.5 listing of Difficult Creek regarding the reported presence of trout in the stream (enclosed). We provided information and justification for not listing the upper portion of the stream near our North Branch Power Station (DNR survey location 6 to headwaters) due to the absence of suitable trout habitat. Based on this information, we have been advised by DEP that Difficult Creek has been proposed for removal from the Tier 2.5 designation.

Based on the absence of suitable trout habitat in the upper portion of the stream, Dominion believes that Difficult Creek should also not be designated as a trout stream pursuant to the Water Quality Standards Program. Therefore, we similarly request the removal of either all or at least the upper portion of Difficult Creek from the official Trout List in the Water Quality Standards Program.

Thank you for your consideration. Please call Jud White of my staff (804-273-2948) if you have any questions.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Enclosure

Cc: Pat Campbell – DEP DWWM

Pamela F. Faggert
Vice President and Chief Environmental Officer
5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

Dominion

FILE COPY

July 22, 2003

Ms. Allyn G. Turner
Director, Division of Water and Waste Management
1201 Greenbrier Street
Charleston, WV 25311
Attn: Tier 2.5 Objection

Dear Ms. Turner:

On May 31, 2002 Virginia Electric and Power Company, a division of Dominion Resources, Inc. (Dominion), provided the Department of Environmental Protection (DEP) with our objection to the proposed Tier 2.5 listing of Difficult Creek (see copy enclosed). This objection was based on the unsuitability of the Difficult Creek headwaters as a Tier 2.5 stream due to local site-specific conditions. Recently, we received a May 27, 2003 letter from your office recognizing receipt of our objection and notifying us of an opportunity to provide you with additional information supporting our objection. In response, Dominion reiterates its objection and offers additional information herein and attached.

As provided in your May 27, 2003 letter, the DEP must consider several factors to decide whether to grant exemptions to the presumptive listing. These factors are set forth in §4H.1.a.2 of the rule. We have reviewed these factors and believe that several are directly relevant to our objection.

LOCATION OF WATER

Dominion believes that the location of the upper Difficult Creek watershed is not supportive of wild trout, which is the basis for the Tier 2.5 designation. Wild trout populations generally require cold, well-oxygenated water; in-stream cover, such as logs, boulders and undercut banks; overhead canopy; stable water flows; silt-free gravel for spawning; and a mix of pools and riffles. These conditions are present in the lower reaches of Difficult Creek but are not present in the upper headwater area. In its headwaters, Difficult Creek is a slow, meandering stream with mud banks and bottoms, broad wetland areas, and sparse to absent tree canopy.

EXISTING WATER QUALITY

Dominion believes that the existing water quality in the upper Difficult Creek watershed is not supportive of a Tier 2.5 designation. As described above, the physical stream morphology of upper Difficult Creek is not typically associated with high quality streams, but would be expected to render conditions more normally associated with poor water quality for brook trout (i.e., higher temperatures and lower dissolved oxygen concentrations).

UNIQUE OR EXCEPTIONAL ECOLOGICAL, RECREATIONAL, OR AESTHETIC RESOURCE VALUE

Dominion believes that the upper headwaters of Difficult Creek are not unique or exceptional. While the area is sparsely populated, it is not pristine or undisturbed. Additionally, it is surrounded by private lands and is not accessible by the public. Several physical features, such as North Branch Power Station, an electrical transmission line, water production wells, abandoned logging roads, active access roads, livestock pastures, and an inactive coal mine and refuse pile, punctuate the area. The area appears to have experienced impacts from clearing and timbering operations. The attached photographs provide a visualization of the upper headwaters of Difficult Creek.

IMPACT ON ECONOMIC DEVELOPMENT

Dominion believes that Tier 2.5 designation for the upper headwaters of Difficult Creek would have an adverse impact on economic development of Grant County and surrounding localities. The upper headwaters of Difficult Creek are located in an area of the state that suffers from a lack of economic vitality. The presence of North Branch Power Station offers an opportunity as an anchor industry that can attract suitably compatible economic development. However, the designation of Difficult Creek as a Tier 2.5 stream would have a discouraging effect on economic development in the area. For example, the Tier 2.5 listing would likely represent a fatal barrier to the siting of a compatible steam host industry and configuration of the power station as a cogeneration facility, even with a sharing of wastewater system and discharges.

IMPACT ON PRIVATE PROPERTY OWNERS

Dominion believes that Tier 2.5 designation of the upper Difficult Creek watershed could have a substantial adverse impact to private property owners. A portion of the upper headwaters of Difficult Creek is located adjacent to our North Branch Power Station and the stream currently serves as the receiving body of water for process wastewater and stormwater runoff from the facility. Tier 2.5 listing designation could restrict any future additions to the power station, changes to its operations and treatment systems, and any future economic development related to the location and operation of the power station. For example, the designation could restrict expansion or efficiency upgrades of North Branch Power Station by barring the addition of station discharges to Difficult Creek.

OTHER FACTORS DETERMINED BY THE ENVIRONMENTAL QUALITY BOARD

The DEP has presumptively listed the entire 5.17 miles of Difficult Creek as a Tier 2.5 stream. This listing is based solely on a determination that Difficult Creek supports a naturally reproducing trout population. In making our original listing objection, we noted that the DNR

data used to list Difficult Creek confirmed that no trout have been observed in the upper reach of the West Fork of Difficult Creek adjacent to Dominion's North Branch Power Station. We also presented our belief that the lack of trout in this upper section of the creek can be explained by the physical characteristics of this stream section, which produce water quality characteristics that are not conducive to the survival and propagation of natural trout populations. In order to provide the DEP with additional information to support our initial Tier 2.5 objection, Dominion personnel performed, and photo-documented, a survey of the upper reaches of Difficult Creek. The results of this survey are presented as an attachment to this letter.

In conclusion, Dominion continues to object to the Tier 2.5 listing of the upper portion of Difficult Creek due to credible evidence that the physical features of this stream section produce existing water quality characteristics that are not conducive to the survival and propagation of natural trout populations. Additionally, the effect of the proposed designation will be an increase in the risk of adverse economic impacts to an area of West Virginia in an economically disadvantaged region of the state. Consequently, for all of the above reasons, we reiterate our request that the section of Difficult Creek from DNR survey location 6 to its headwaters be excluded from Tier 2.5 listing.

Thank you in advance for your consideration of these comments. Please feel free to contact Ken Roller at 804-273-3494.

Sincerely,

Pamela F. Faggert

Pamela F. Faggert

Enclosures

Pamela F. Faggert
Vice President and Chief Environmental Officer
5000 Dominion Boulevard, Glen Allen, VA 23060
Phone: 804-273-3467

Dominion

May 31, 2002

Ms. Allyn Turner
Director, Division of Water Resources
West Virginia Department of Environmental Protection
1201 Greenbrier Street
Charleston, WV 25311-1088
Attn: Tier 2.5

RE: Objection to proposed Tier 2.5 listing of Difficult Creek, a tributary of the North Branch Potomac River: DNR Code PNB-18

Dear Ms. Turner:

Virginia Electric and Power Company, a division of Dominion Resources, Inc. (Dominion) is an owner of real estate property located along Difficult Creek, which has been listed on West Virginia's presumptive list of Tier 2.5 waters. The name, address, contact telephone number, and tax number of our property are provided below:

North Branch Power Station
2000 Energy Way
Gormania, West Virginia 26707
State Tax # : ELC-101101
Contact: Ken Roller (804) 273-3494

The presumptive Tier 2.5 list includes the entire 5.17 miles of Difficult Creek, from its headwaters to its confluence with the North Branch Potomac River. The reason for the listing of Difficult Creek is given as trout waters. Dominion environmental staff requested, and was provided with, the data used to make a determination to presumptively list Difficult Creek. The data that were provided to us consist of summaries of the results of stream surveys performed at various locations in Difficult Creek by the West Virginia Division of Natural Resources (WVDNR). A summary of these data is included as an attachment to this letter.

The WVDNR data provided to Dominion included stream surveys at six locations along Difficult Creek (referred to as survey locations 1 – 6 in the attached table and topographic map). Most of the survey data were collected during October 1978 and July 1982. An additional survey of location 3 and one at a new location 6 were performed on August 7, 1996. Brook trout (*Salvelinus fontinalis*) were found at sampling locations 1 – 5, supporting the Tier 2.5 listing of the section of Difficult Creek encompassed by these stations (i.e., to approximately 3.0 miles above the mouth on the mainstem, and on the East Fork to about 0.2 miles above the mainstem). Trout were not present at the most upstream survey station 6,

which, is located on the West Fork of Difficult Creek at the pipeline and powerline crossing about 4.1 miles above the mouth (see attached topographic map).

Station 6 is located adjacent to Dominion's North Branch Power Station, and is approximately 0.5 miles downstream of the station's NPDES discharge Outlet 001. The North Branch Power Station was not operating at the time of the August 1996 survey, and had been in an "inactive reserve" status since January 1996. Consequently, during the survey, and for some time before, any discharge from the station would have consisted of stormwater runoff from the inactive plant, which should not have impacted brook trout downstream in the creek. Operation of the North Branch Power Station resumed during the summer of 1999.

Following discharge from Outlet 001, the North Branch Power Station effluent travels a short distance before entering a boggy area, which is believed to be a natural feature of Difficult Creek and is not the direct result of the station's discharge (see attached topographic map). Dominion believes that the "boggy" nature of the upper reach of Difficult Creek (e.g., higher water temperatures and lower dissolved oxygen concentrations) affects the quality of Difficult Creek for some undetermined distance downstream. Additionally, some timbering has occurred immediately upstream of station 6 resulting in loss of stream canopy. These conditions, in conjunction with the stream survey results obtained approximately 0.5 miles downstream, preclude a reasonable presumption that the West Fork of Difficult Creek (at least that portion from the location of sampling station 6 to its headwaters) is a Tier 2.5 water.

Given the uncertain quality of the Difficult Creek segment in question, and the very real potential that its inclusion on the Tier 2.5 list could significantly impact future operations at our North Branch Power Station, we respectfully request that the section of Difficult Creek from survey location 6 to its headwaters be excluded from Tier 2.5 listing.

Dominion appreciates the opportunity to express our concerns relative to the listing of Difficult Creek, and trusts that they will be given serious consideration. Please feel free to contact Ken Roller at the phone number above should you have any questions concerning this submittal.

Sincerely,

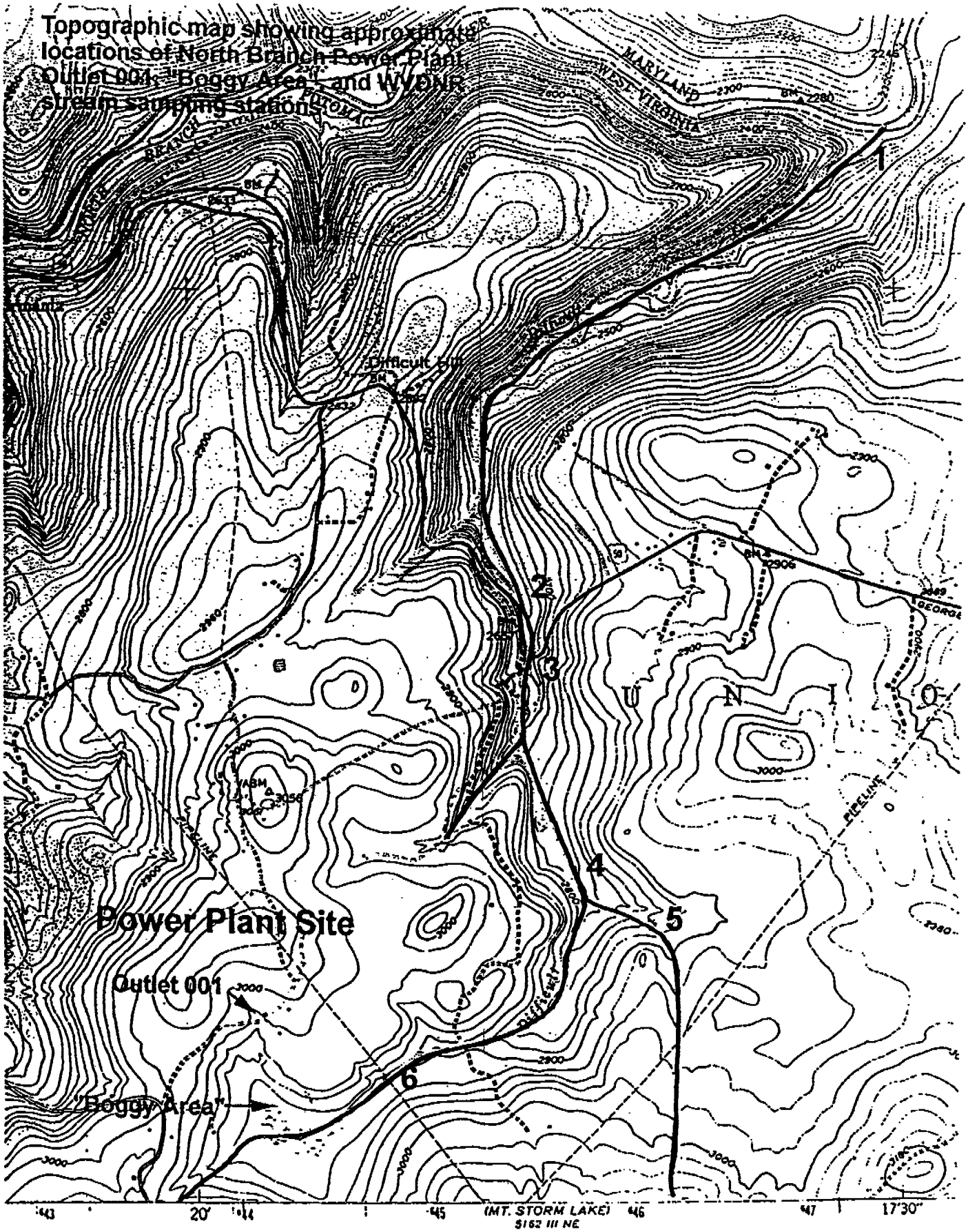
Pamela F. Faggert

Pamela F. Faggert

Summary of WVDNR stream survey data used to list Difficult Creek (Approximate station locations are shown on the attached topographic map).

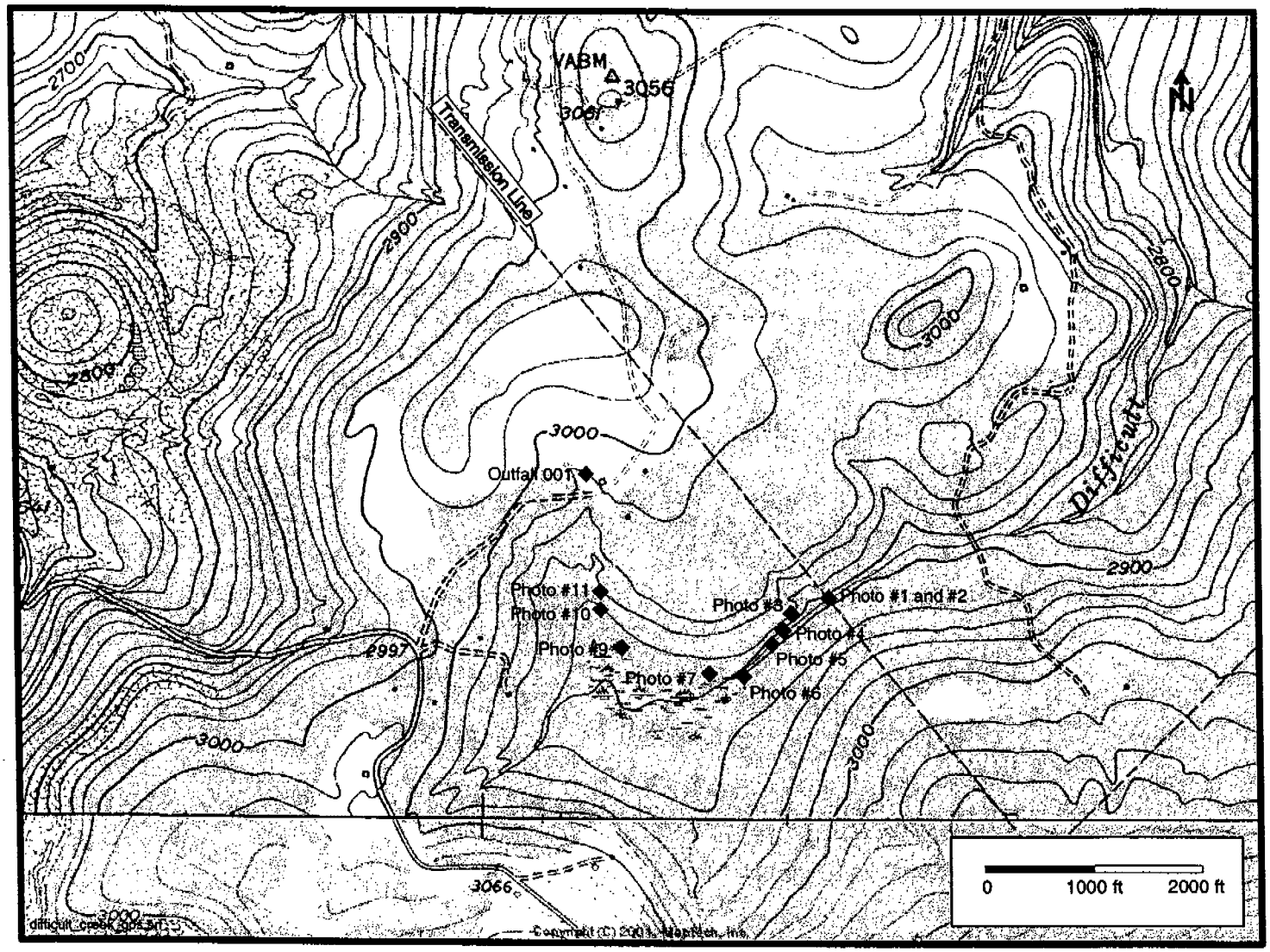
Station	Survey Location	Survey Date	Trout Present?
1	0 miles upstream from mouth	10/24/78	Brook Trout
2	2.0 miles upstream from mouth	10/24/78	Brook Trout
3	2.25 miles above mouth where US Rt. 50 crosses Difficult Creek	07/01/82	Brook Trout
3	2.25 miles above mouth where US Rt. 50 crosses Difficult Creek, 3 miles east of Gormania; south side of Route 50.	08/07/96	Brook Trout
4	3.0 miles above mouth, mainstem below fork.	07/01/82	Brook Trout
5	3.3 miles above mouth on East Fork of Difficult Creek, 0.2 miles above forks.	07/01/82	Brook Trout
6[A]	4.1 miles above mouth on West Fork at gasline and powerline crossing (approximately 0.5 miles downstream of the North Branch Power Station discharge)	08/07/96	**None found**

A = The Tier 2.5 stream survey data form obtained from the WVDNR for this sampling location indicates that this sampling station was on the East Fork of Difficult Creek. Based on the UTM coordinates provided, the reference to the inactive power station, and discussions with WVDNR staff, Dominion has determined that this sampling station is was located on the West Fork of Difficult Creek as shown on the attached topographic map.


Topographic map showing approximate locations of North Branch Power Plant Outlet 001, "Boggy Area", and WVDNR stream sampling stations
MARYLAND
WEST VIRGINIA
Difficult Run
Power Plant Site
Outlet 001
"Boggy Area"
1
2
3
4
5
6
PIPELINE
(MT. STORM LAKE)
17'30"
20'

Upper Difficult Creek

Characterization of Upper Difficult Creek as Potential Trout Habitat



The following photographs were taken on June 11, 2003 in the upper reaches of the Difficult Creek watershed as shown on the above map. A description of the photograph locations is provided below. The photographs show the upper reaches of Difficult Creek to be a slow, meandering stream with mud banks and bottoms. The stream flows through broad areas of wetlands with sparse to absent tree canopy and eventually retrogrades into an undefined stream. The discharge from North Branch Power Station's Outlet 001 travels approximately 1000 feet before diffusing into a broad wetland. Dominion believes that the upper reaches of Difficult Creek is sub-par trout habitat and should not be regulated as a Tier 2.5 stream.

Photograph #1 View of Difficult Creek at Transmission Line crossing looking downstream to the northeast. No tree canopy in this area. WVDEQ reported no trout at this location in 1996.

Photograph #2 View of Difficult Creek at Transmission Line crossing looking upstream to the southwest. Partial tree canopy in this area. WVDEQ reported no trout at this location in 1996.

Photograph #3 View of Difficult Creek looking to the southwest. Wetlands shown in background through the trees.

Photograph #4 View of Difficult Creek looking to the southwest. Abundant wetlands are prominent and stream becomes sluggish and meandering.

Photograph #5 View of Difficult Creek looking to the southwest. Creek continues to meander through wetlands with mud sides and stream bottom.

Photograph #6 View of Difficult Creek looking to the southwest. Creek continues to traverse through wetlands with sparse to absent tree canopy and signs of timbering.

Photograph #7 View of Difficult Creek looking to the south. Creek narrows and continues to meander through wetlands.

Photograph #9 View of Difficult Creek looking south across wetland. Creek definition is lost and replaced by broad wetland area.

Photograph #10 View of Difficult Creek looking west across wetland. Creek definition is lost. Note beaver hut and standing water in wetland.

Photograph #11 View of drainage swale or ditch from Outlet 001 looking north prior to entry into wetland shown in Photograph #10.

Lisa McClung, Director
Division of Water and Waste Management
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Re: Comment on proposed 47 CSR 2, Requirements Governing Water Quality Standards

Dear Ms. McClung:

West Virginia Rivers Coalition submits these comments on behalf of, and in collaboration with, the organizations and individuals listed on the signatory page of this document. Each signatory has a vested interest in the quality of West Virginia's waters and believes that these comments are important to the future health of these valuable resources.

The following comments address WVDEP's proposed rules, 47 CSR 2, "Requirements Governing Water Quality Standards". In brief, the comments focus on four aspects of changes to the water quality standards:

1. The revised list of trout waters,
2. New nutrient criteria for lakes and reservoirs,
3. Removal of site-specific criteria for several streams,
4. Removal of the Blackwater River from the B-2 trout water list, and
5. Changes to many criteria for metals.

1. The revised list of trout waters

Similar to its actions with the list of Tier 2.5 waters, WVDEP has spent a tremendous amount of effort trying to appropriately identify streams requiring Category B2 "Trout Waters" designation. Before we specifically address the B2 list in the following sections, we would like to first commend WVDEP for listing an additional 337 streams as "Trout Waters" as defined by Section 2.19 of the proposed rule, 47 CSR 2. ***We strongly encourage WVDEP to uphold these proposed designations.***

The listing of these streams provides exceptional benefits for the state and upholds the intent of the rule; whereas:

"It is declared to be the public policy 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 agriculture and the provision of a permanent foundation for healthy industrial development."[1]

1.a) Revising the rule

WVDEP's decisions for B2 designations were made in close consultation with West Virginia Division of Natural Resources (WVDNR) biologists—particularly those from the Coldwater Management Section. Throughout the upcoming months during which the water quality standards package is reviewed by legislative committees, we encourage WVDEP to continue recognizing WVDNR as *the* expert agency with regards to the assessment of trout populations and trout streams across the state. WVDEP and WVDNR relied on decades of monitoring data at hundreds of sites to make decisions about designating streams as Category B2.

The criteria that WVDNR uses to identify "trout waters" as defined by Section 2.19 are further detailed in WVDEP's briefing document about the proposed rule.[2]

1.b) "Existing use" designations are a Clean Water Act requirement

Sections 4.1.a and 6.1.b of 47 CSR 2 require the protection of existing uses. "Existing uses" are "those uses actually attained in a water body on or after November 28, 1975."[3] The proposed B2 list therefore correctly includes waters where sustained year-round trout populations, or trout reproduction, have been documented since November 28, 1975. *We commend WVDEP for taking these required actions.*

---

[1] Section 1.1 of 47 CSR 2, "Requirements Governing Water Quality Standards" (See also W.Va. Code §22-11-2). Note: The addition of 337 streams to the Category B2 "Trout Waters" list within the rule, 47 CSR 2, appropriately reflects federal requirements outlined in sections 101(a) (2) and 303(c) of the Clean Water Act, as well as criteria outlined in 40 CFR 131.10(a) and (b).

[2] Briefing Document for proposed rule, 47 CSR 2, "Requirements Governing Water Quality Standards." Available online: http://www.wvdep.org/show_blob.cfm?ID=10641&Name=BRIEFING_DOCUMENT_WQS.pdf.

[3] See also 40 CFR 131.3

1.c) The importance of trout streams

We would also like to recognize that the listing of streams as trout waters based on existing use upholds the Clean Water Act objective listed in Section 101(a) "to restore and maintain the chemical, physical, and biological integrity of the Nation's waters." By listing streams as Category B2 based upon eligibility provided by existing use, WVDEP is not only remaining consistent with the Act, but it is also exhibiting a tremendous effort to reach the goals of the Act to restore polluted waters.

In West Virginia, for example, numerous trout streams have suffered from siltation, acid rain, acid mine drainage, sewage, and other pollutants. The value of these streams to the state's economy is significant. While streams that currently support year-round trout populations are generous sources of revenue for the state,[4] streams that once supported these populations may provide similar benefits in the future.

The Middle Fork of the Tygart River in Randolph, Upshur and Barbour counties, for example, has restoration projects carried out by WVDEP and WVDNR that have remediated impacts from acid rain and acid mine drainage with treatment projects in its headwaters.[5]

According to WVDNR, there are now stocking programs, brown trout are spawning in upper reaches of the Middle Fork, and brook trout fisheries are restored throughout numerous tributaries. According to WVDNR, 150 miles of Middle Fork trout stream have been rehabilitated for less than $600 per mile each year– far less than the $40,000 each of these miles is thought to provide in economic impacts.[6]

The above-mentioned scenario provides evidence that designating trout streams based on existing use is not only required by the Clean Water Act, but also a proven action that upholds the integrity of the Clean Water Act and provides a valuable service for the state.

1.d) Tier 2.5 listings and B2 designation are separate processes

---

[4] One mile of trout stream in West Virginia has an estimated economic impact worth $40,000 annually. http://www.envirovaluation.org/index.php?title=wtrf_www_wtrf_com_channel_7_cbs_wheeling&more=1&c=1&tb=1&pb=1 Accessed: July 5, 2006.

[5] http://www.wtrf.com/story.cfm?func=viewstory&storyid=3394 Accessed July 14, 2006. http://www.envirovaluation.org/index.php?title=wtrf_www_wtrf_com_channel_7_cbs_wheeling&more=1&c=1&tb=1&pb=1 Accessed: July 14, 2006.

[6] http://www.wtrf.com/story.cfm?func=viewstory&storyid=3394 Accessed July 14, 2006. http://www.envirovaluation.org/index.php?title=wtrf_www_wtrf_com_channel_7_cbs_wheeling&more=1&c=1&tb=1&pb=1 Accessed: July 14, 2006.

Listing streams for Tier 2.5 protections and designating streams as Category B2 "Trout Waters" are completely different processes, with different protections.

At times throughout the Tier 2.5 listing process, including comments made during the July 10, 2006 public hearing concerning the rule, 60 CSR 5, some parties objecting to listing streams for Tier 2.5 protections argued that these protections are not needed because "very stringent" water quality criteria (B2) are already in place for trout streams.[7]

In the upcoming months, we encourage WVDEP to reiterate that water quality criteria and antidegradation are separate procedures. [8]

2. New nutrient criteria for lakes and reservoirs

The proposed rules include new nutrient criteria for lakes and reservoirs. Criteria are proposed for total phosphorus and chlorophyll a, and more stringent criteria are proposed for cool and cold water lakes. A list of cool and cold water lakes is included in a new Appendix F. The criteria in the new Section 8.3.b make it clear that while four or more samples are recommended between May and October, the Secretary can still make nutrient-related listings according Section 3.2, the narrative conditions not allowable in State waters.

The West Virginia Rivers Coalition participated actively in the Nutrient Criteria Committee, which was formed by the Environmental Quality Board in 2002 and continued meeting through 2006 after WVDEP took over responsibility for water quality standards. The Committee performed a considerable amount of research on lakes and reservoir criteria. The designed and implemented a monitoring program in summer 2004 to bring new West Virginia data into the analysis. The Committee eventually went through a weight-of-evidence process to reach consensus on the criteria that WVDEP has now proposed.

We commend WVDEP for adopting the Nutrient Criteria Committee's consensus, and recommend that the agency maintain these criteria now, and advocate for their adoption by the legislature and their approval by the United States Environmental Protection Agency.

---

[7] Letter from Plum Creek Timber Company (Steve Yeager, Resource Supervisor) to West Virginia Department of Environmental Protection (Lisa McClung, Director of Division of Water and Waste Management) concerning Tier 2.5 listings: Dated December 19, 2005; Letter from Mead Westvaco (Kevin Wall, V.P. Engineering) to West Virginia Department of Environmental Protection (Lisa McClung, Director of Division of Water and Waste Management) concerning continued objections to Tier 2.5 listings: Dated December 28, 2005.

[8] Water quality standards and antidegradation policy are defined at 40 CFR sections 131.2 and 131.12, respectively.

3. Removal of site-specific exemptions from water quality criteria for several streams

Site-specific exemptions from water quality criteria should be granted only in very limited situations, and should be removed when they expire. We commend WVDEP for reviewing these exemptions and proposing that three be removed:

- Section 7.2.d.6.1, which exempted Stony River from thermal criteria, which expired in 1998;
- Section 7.2.d.20.3, which set site-specific numeric temperature criteria for Simmons Creek, which also expired in 1998; and
- Section 7.2.d.14.1, which excluded Water Use Categories A and E certain tributaries of the Youghiogheny River, for which WVDEP was unable to find any documentation.

We support these deletions from the water quality standards rule.

4. Removal of the Blackwater River from the B-2 trout water list

The current water quality standards classifies the ***entire length of the Blackwater River*** as a B-2 trout water. Section 7.2.d.9 applies to the Blackwater River below Davis, and the Blackwater above Davis is listed in Appendix A as a B-2 trout water.

WVDEP proposes to delete both of these listings, and to replace them with a listing in Appendix A for the Blackwater River from the mouth of North Fork upstream. If approved, the entire length of the Blackwater River below the confluence with the North Fork would be removed from the B-2 list.

In explaining this change, WVDEP's Briefing Document simply states: "In section 7.2.d.9, the Blackwater River is referred to as a trout stream, which is repetitive since it is listed on the trout list in Appendix A. Therefore, section 7.2.d.9 has been amended." This statement is false. The proposed change is not simply the removal of a repetitive reference; it is a delisting of miles of the Blackwater River.

According to the Clean Water Act, WVDEP cannot remove uses without performing a Use Attainability Analysis. WVDEP has given no indication that a UAA has been performed for the Blackwater River. WVDEP must therefore keep the entire Blackwater River on the B-2 list of trout waters at this time.

5. Changes to many criteria for metals

WVDEP proposes to modify the formulas in Appendix E for five metals: cadmium, copper, nickel, silver, and zinc. We agree with WVDEP that these updates reflect those recommended by EPA in 2002.

For clarity, we suggest that the wording and formulas in Sections 8.9.2 and 8.9.3 for dissolved trivalent chromium be edited to be consistent with those used for cadmium, copper, lead, nickel, silver, and zinc.

Sincerely,

Liz Garland
Executive Director
West Virginia Rivers Coalition

Cindy Rank
Mining Chair
West Virginia Highlands Conservancy

Don Garvin
Legislative Coordinator
West Virginia Environmental Council

Don Gasper
Retired Fisheries Biologist
WV Division of Natural Resources

Neil Gillies
Executive Director
Cacapon Institute

Deana Smith
President
Friends of the Little Kanawha

WestVirginiaUniversity
Davis College of Agriculture, Forestry and Consumer Sciences

July 13, 2006

Lisa McClung, Director
WVDEP DWWM
601 57th Street S.E.
Charleston, WV 25304

RE: Comment on proposed 47 CSR 2, Requirements Governing Water Quality Standards

Dear Ms. McClung:

As you are aware, I chaired the Nutrient Criteria Committee which was formed by the Environmental Quality Board in 2002 and continued meeting through 2006 under the supervision of the West Virginia Department of Environmental Protection. As you are also aware, the committee reached a consensus on new criteria for lakes and reservoirs for phosphorus and chlorophyll-a, and announced this consensus at WVDEP's public meeting on water quality standards on April 28. This consensus is accurately represented in the current draft rule.

Thank you for taking the hard work of the Committee seriously. I urge the WVDEP to preserve the nutrient-related language in the current rule and to continue your efforts to ultimately gain approval from the legislature and the United States Environmental Protection Agency.

Sincerely,

Tom Brand
Nutrient Criteria Committee Chair

WV Agricultural and Forestry Experiment Station
Office of the Dean and Director

Phone: 304-293-2395
Fax: 304-293-3740
www.cafcs.wvu.edu

1170 Agricultural Sciences
PO Box 6108
Morgantown, WV 26506-6108

Scott,

Please accept our apologies. Here is the attachment we referenced in yesterday's submission. If you have any questions please call me at 344-9867.

Best regards,
Charlie Burd,
Executive Director, IOGA-WV

IOGA
WEST VIRGINIA

June 9, 2004

Mr. Edward M. Snyder, Chair
West Virginia Environmental Quality Board
1615 Washington St. E. Suite 301
Charleston, WV 25311-2126

Dear Dr. Snyder

On behalf of the Independent Oil and Gas Association of West Virginia ("IOGA"), I am submitting a revised version of a proposal previously submitted to the Board by IOGA on May 5, 2004. Our revised proposal for review by the Environmental Quality Board, relates to the consideration of streams for inclusion on the list of "trout waters," Appendix A of the Board's water quality standards (46 CSR 1).

Should the Board have any questions concerning the enclosure, please let us know. We appreciate the Board's consideration of this proposal.

Very truly yours,

Charlie Burd

Charlie Burd
Executive Director

INDEPENDENT OIL AND GAS ASSOCIATION OF WEST VIRGINIA, INC.
405 Capitol Street, Suite 507 Charleston, WV 25301 Phone (304) 344-9867 Fax (304) 344-5836

To: Environmental Quality Board
From: Environmental Committee, Independent Oil and Gas Association of West Virginia,

Date: June 9, 2004

Re: Revised Proposal for Adding/Deleting West Virginia Waters as Trout Streams – Targeted Hearing Option

---

In 2003 the Environmental Quality Board proposed adding over 400 streams to the list of trout waters in Appendix A of the water quality standards. Also during 2003 the Department of Natural Resources suggested to the EQB that there were a number of streams currently included on Appendix A that would **not** qualify as "trout waters." It has been and continues to be IOGA's position that the technical accuracy and practical impact from inclusion on the list in Appendix A for each water body should be carefully considered before a stream is added to the list. IOGA also supports the removal of any streams or stream segments that do not meet the definition of "trout waters." The following proposal methodically evaluates the expansion of the trout waters list and provides for targeted public hearings so as to provide sufficient opportunity for public comment on the important policy issues associated with expansions to or deletions from the list in Appendix A.

A. Introduction of Streams – Approximately 420 steams to be addressed[1]

   1. Group streams by county

   2. Consider approximately 60 streams/yr

B. Considerations Regarding Public Hearings

   1. Hold 2 hearings/year (est. $2,500/hearing)

   2. Choose sites for hearings based on locations of streams under consideration

   3. Provide reasonable opportunity for people most affected by listing/deletions to attend

C. First Year

   1. General stream data collection

   2. Determine streams to be considered for inclusion in next triennial review considering location and number of streams in that area;

---

[1] Includes 407 streams proposed for addition as per EQB 2003 proposal and approximately 13 streams suggested for deletion by DNR (exact number not known).

3. Solicit data on targeted streams

4. Announce schedule for hearings

D. Third Year and Sixth Year

1. Determine streams to be considered for inclusion in next triennial review taking into account location and number of streams in that area

2. Collect data for streams to be considered

3. Continue to hold two hearings each year and evaluate feedback

E. When to amend the trout waters list

1. During each triennial review

a. If all proposed streams are retained, could expect to add up to approximately 180 during each triennial review

F. Benefits to Targeted Hearing Approach

a. Allows sufficient time to propose other additions and to propose removing streams from list

b. Prevents need for legislative approval or rule changes each year

c. Allows adequate time for methodical consideration

d. Additions to/deletions from the trout waters list coincide with triennial review

Proposed Trout Stream Additions

The list below provides a method for the logical consideration of streams to add to or delete from the trout waters list. This proposed method was designed in light of the proposed number of streams to be added in each county, and the ability of the public to meaningfully comment on such an expansion. This proposal anticipates two public hearings per year and potentially adds approximately 407 new water bodies during the course of three triennial reviews. Proposed deletions from the trout waters list are not included in this proposal and would need to be scheduled in coordination with the following:

- Pocahontas County: 49 proposed stream additions → 2 meetings (Marlinton, WV)
- Randolph County: 102 proposed stream additions → 5 meetings (Elkins, WV)
- Pendleton County: 30 proposed stream additions → 1 meeting (Franklin, WV)
- Grant County (14), Hardy County (3), Mineral County (4), Hampshire County (2), Morgan-Berkley Counties (1): 24 proposed stream additions → 1 meeting (Moorefield or Romney, WV)
- Tucker County: 34 proposed stream additions → 2 meetings (Parsons, WV)
- Hancock County (1), Ohio County (1), Preston County (18), Barbour County (3): 23 proposed stream additions → 1 meeting (Morgantown, WV)
- Upshur County (13), Braxton County (3), Clay County (3): 19 proposed stream additions → 1 meeting
- Webster County: 33 proposed stream additions → 2 meetings (Webster Springs, WV)
- Nicholas County: 24 proposed stream additions → 1 meeting
- Fayette County (9), Raleigh County (7), Summers County (1), Mercer County (3), McDowell County (4), Monroe County (3): 27 proposed stream additions → 1 meeting (Beckley or Fayetteville, WV)
- Greenbrier County: 26 proposed stream additions → 1 meeting (Lewisburg, WV)

Number of Proposed Trout Stream Additions in Each County

- Pocahontas County: 49
  - Pocahontas-Randolph: 3
  - Pocahontas-Webster: 1
  - Pocahontas-Webster -Nicholas: 2
- Randolph County: 102
- Pendleton County: 30
- Grant County: 14
  - Grant-Pendleton: 1
- Hardy County: 3
- Mineral County: 4
- Hampshire County: 2
- Morgan-Berkley Counties: 1
- Tucker County: 34
  - Preston-Tucker: 3
  - Tucker-Randolph: 1
- Hancock County: 1
- Ohio County: 1
- Preston County: 17
- Barbour County: 3
- Upshur County: 13
  - Upshur-Randolph: 4
- Braxton County: 3
- Webster County: 27
  - Webster-Nicholas: 1
  - Webster-Randolph: 2
- Nicholas County: 20
  - Nicholas-Randolph: 1
- Clay County: 3
- Fayette County: 9
- Raleigh County: 7
- Summers County: 1
- Mercer County: 3
- McDowell County: 4
- Greenbrier County: 26
  - Greenbrier- Monroe: 1
  - Greenbrier Nicholas: 4
- Boone County: 1
- Monroe County: 2
- Preston-Taylor-Monongalia: 1
- Unidentified County: 1

Total # of proposed streams: 407

From: James Boswell <JBoswell@peabodyenergy.com>
To: <smandirola@wvdep.org>
Date: 7/17/2006 5:16:31 PM
Subject: Water Quality Standards Comments

I had a question regarding the trout waters list in the proposed rule. The Appendix A, Category B-2 Trout Waters List does not match the list proposed in the antidegradation rule. Under the Kanawha River watershed, stream segment KC-31-B, Hopkins Fork, was incorrectly added to the list in the proposed rule. This stream segment was not on the proposed antidegradation rule, and was specifically listed as ?removed for technical reasons prior to 9/05? on the Streams Removed from the Original Presumptive List of Waters of Special Concern (Tier 2.5 Streams) document. I am under the assumption that the list in the proposed antidegradation rule was the correct list, because this was the primary issue open for comment. However, if I am wrong, I would like to submit comments on the water quality proposed rule by the end of business today via email if possible.

Jimmy

James S. Boswell
Peabody Energy
7100 Eagle Crest Blvd., Ste. 200
Evansville, IN 47715
Direct Line (812) 434-8553
Cell (812) 454-4164
Fax (812) 424-9064
Email: jboswell@peabodyenergy.com

---

101 South Queen Street
Martinsburg, West Virginia 25401
(304) 263-0836

7000 Hampton Center, Suite K
Morgantown, West Virginia 26505
(304) 285-2500

155 East Main Street, Suite 300
Lexington, Kentucky 40507
(859) 252-2202

Bowles Rice
McDavid Graff & Love LLP
Attorneys at Law

600 Quarrier Street
Charleston, West Virginia 25301

Post Office Box 1386
Charleston, West Virginia 25325-1386
(304) 347-1100

www.bowlesrice.com

19 West Cork Street, Suite 102
Winchester, Virginia 22601
(540) 723-8877

5th Floor, United Square
501 Avery Street
Parkersburg, West Virginia 26101
(304) 485-8500

July 17, 2006

Jennie L. Henthorn
Telephone — (304) 347-1162
Facsimile — (304) 347-1196
E-Mail Address:
jhenthorn@bowlesrice.com

Mr. Scott G. Mandirola, Assistant Director
Water Quality Standards Program
WV Department of Environmental Protection
601 57th Street SE
Charleston, West Virginia 25304

HAND DELIVERY

Re: 47 CSR § 2 – Water Quality Standards
Comments on Proposed Rule

Dear Mr. Mandirola:

This letter is submitted on behalf of Century Aluminum of West Virginia, Inc. ("CAWV"), in support of the proposed revision to the aluminum criteria set forth in 47 CSR § 2 - "Requirements Governing Water Quality Standards." CAWV has been involved in the efforts regarding West Virginia's aluminum criteria for twelve years. As the West Virginia Department of Environmental Protection ("DEP") is aware, this process has been lengthy and technically complex.

DEP now proposes to make final the interim aluminum criteria adopted in 2004. CAWV supports this proposal. In its recent approval document, the United States Environmental Protection Agency ("EPA") stated that "[t]he criteria are protective of the aquatic life regardless of whether they apply temporarily or permanently."

Importantly, the proposed revision is supported not only by the statement by US EPA, but also by the substantial information in the administrative record for the 2004 revision to the aluminum criteria. CAWV incorporates by reference the information submitted in 2004 by the West Virginia Manufacturers Association, West Virginia Chamber of Commerce, and the West Virginia Coal Association to support the revision to the chronic aluminum criteria. This information sets forth the basis for the USEPA determination that the proposed revision to the aluminum criteria is protective of aquatic life.

CAWV appreciates the opportunity to participate in the evaluation of the aluminum criteria and looks forward to the resolution of this very important matter. If you have any questions, please do not hesitate to contact me.

Very truly yours,

Jennie L. Henthorn

Jennie L. Henthorn
Environmental Chemist

JLH/vls

WEST VIRGINIA CHAMBER OF COMMERCE
The Voice of Business in West Virginia

July 17, 2006

Lisa McClung, Director
Division of Water and Waste Management
Department of Environmental Protection
601 57th Street, S.E.
Charleston, West Virginia 25304

Re: Comments to Revisions to Existing Legislative Rules: 47CSR2

Dear Ms. McClung:

These comments are filed on behalf of the West Virginia Chamber of Commerce ("the Chamber"). The Chamber is the largest, most influential general business organization, representing all business sectors in every region of the state. Members range from small business enterprises to mid-size manufacturers to tourism destinations to energy companies to Fortune 500 corporations. However, small businesses are the core of our membership -- making up 95 percent of the West Virginia Chamber's companies and firms.

I. Aluminum Criteria

The Chamber supports the DEP's proposal with respect to the aluminum criteria. The issue of the appropriate aluminum criteria for West Virginia waters has been studied and commented upon for many years. The Chamber participated with other groups representing the regulated community in presenting the DEP and the Environmental Quality Board with extensive information on the studies available on aluminum toxicity in aquatic environments, the flaws in the criteria developed by USEPA, the lack of any aluminum criteria in most of the surrounding states, the appropriateness of a dissolved versus a total standard for assessing impact on aquatic life and many other issues. In light of the considerable scientific evidence to support the protectiveness of the current (and proposed criteria) and with the USEPA's approval of the aluminum standard "based on a finding that the criteria are protective of aquatic life use regardless of whether they apply temporarily or permanently,"[1] the Chamber believes that the proposed action by the DEP is fully justified.

II. Addition of 337 Streams to Appendix A

Appendix A of proposed 47 CSR 2 contains the list of known "trout waters" within West Virginia. "Trout waters" are defined as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round populations." 47 CSR 2-2.18. From this definition, it would seem that the DEP must establish that trout live in a stream throughout the year before classifying a stream as a "trout water." A year-round population of trout can be established when there is natural reproduction of trout or when multiple age classes of a trout species are observed in a stream at one time. The DEP's "Briefing Document" states

[1] See letter from Jon Capacasa, USEPA to Lisa McClung DEP dated January 9, 2006.

that "[n]atural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys." Briefing Document, p. 3.

Our cursory review of the data submitted by DNR to the DEP and relied upon by the agency in identifying the proposed additions to the "trout waters" list, however, reveals many instances where the DEP does not have sufficient data to prove that the stream supports year-round populations of trout. Because the decision to include a stream on the "trout waters" list will have such a significant impact, the DEP should not rush the process and should address the following concerns before adding any streams to Appendix A.

A. The stream surveys relied upon by DEP do not provide sufficient information to support the inclusion of many streams

A brief examination of the trout stream surveys conducted by DNR reveals that many of the surveys may not provide a basis for the conclusion that a particular stream supports year round trout populations. While the DEP's Briefing Document states that the "natural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys," it does not appear that information on multiple year classes has been collected in all of the stream surveys. In fact, many of the stream surveys conducted by the DNR in the 1980s only have a small amount of information about trout. Typically they only list the number of trout observed in the survey and their sizes. No further information about the trout observed is given, including no information about whether there are multiple classes of trout in the stream or if natural reproduction was observed.

Conley Run (WVMT-77) provides a typical example of the type of information included in the stream survey data sheets. The DEP proposed to add Conley Run to the list of "trout waters" based upon a single survey conducted on July 28, 1987. This single survey revealed the presence of three brook trout that were seven to nine inches in size. There is no further information given about these trout. The brook trout are not classified as young-of-the-year or and there is no indication that they are from multiple classes. Furthermore, the stream survey gives no indication that natural reproduction was observed in this stream. The DEP also proposes to add Poplar Creek (WVKE-76-O) in Nicholas County on the basis of one survey conducted on July 24, 1985 which showed the presence of four brook trout. Again, there was no notation about natural reproduction or multiple classes. In the absence of such information, the DEP has no basis for adding Conley Run or Poplar Creek to the "trout waters" list according to its own "Briefing Document."

Clearly, there are fatal flaws in the data used to justify the inclusion of these two streams. Due to the limited time available to review the information collected by the DNR we do not know whether the limited information contained in the stream surveys for Conley Run and Poplar Creek is representative of other streams proposed to be added to Appendix A. It appears at the very least, however, that the data provided for Conley Run and Poplar Creek suggest that both the agency and the public need to be given more time to examine the data relied upon by the DEP in making this proposal.

B. In many instances the DNR data were not adequate to characterize the steams as trout waters

Another question raised by the DEP's reliance on the DNR's stream surveys is whether these surveys accurately reflect either the past or current condition of the stream. This is partly because many

streams were not surveyed on a regular basis. DEP's reliance on a snapshot in time and not having available a more comprehensive assessment of stream conditions casts doubt on whether the stream surveys accurately represented the real condition of the stream. It is possible, for example, that a stream survey could have noted the presence of trout fingerlings in a stream, but that this was the result of the stream being stocked recently. In fact, the West Virginia Stream Classification Form for Poplar Creek notes that the presence of brook trout in the stream was "probably a result of stocking by locals." If these streams are being stocked, it calls into question the DEP's inclusion of a stream on the presence of fingerlings only. This type of limited information does not justify a conclusion that Poplar Creek, or any other stream, supports a trout population on a year round basis

The DEP appears to argue that a stream survey that does not conclusively show a year-round population of trout can still support the agency's decision to classify a stream as a "trout water." In the DEP's view, these surveys prove there has been an "existing use" of "trout waters" at some point on or after November 28, 1975, regardless of their current condition. 47 CSR 2-2.26. This interpretation is backward. Unless the DEP has proof that a stream supported a year-round population of trout since November 28, 1975, it should not include that stream on the "trout waters" list without first establishing that the stream is currently capable of supporting a year-round trout population. For streams where such comprehensive surveys do not currently exist, the streams should not be added to Appendix A until such surveys have been completed.

The fact that the DEP is attempting to justify its decision to add streams to the "trout waters" list based upon a very limited data is contrary to the standard the agency has applied in other water quality programs. The DEP's guidance for the Antidegradation program requires that a minimum of twelve samples be taken over a six month period to establish a baseline water quality. West Virginia Department of Environmental Protection, "Antidegradation Guidance: Baseline Water Quality Assessment Procedures," p.3 (2001). When assessing whether a stream is impaired, the TMDL program specifies that twenty samples would compose an "ample data set." West Virginia Department of Environmental Protection, West Virginia Draft Sec. 303(d) List, p. 8 (2006) Just as it is, therefore, established that DEP will not recognize a limited database as justification for a stream classification under the Antidegradation and TMDL programs, DEP should not add a stream to Appendix A on the basis of anything less than a comprehensive survey of fish species, made at different times of the year, and multiple water quality sampling events

The age of some of the stream surveys relied upon by the DEP also presents problems for the agency. The DEP never described the methodology that the DNR used to determine if the stream contained naturally reproducing trout or supported year-round populations in these 1980s-era surveys. These surveys' methods and purposes should be fully described so that the public can assess whether the DEP was justified in relying upon the DNR's surveys.

In summary, the agency has provided no general description of how these surveys (many over 20 years old) were made or why the limited surveys performed support a conclusion regarding the overall (year-round) status of the stream. Moreover, the DEP's approach to these proposed "trout waters" does not comport with the agency's expressed preference for both adequacy of data points and sound methodology in gathering the data. Until data is available that meets standards comparable to those strict standards that have been established for stream classifications in other water quality programs, a stream should not be proposed for inclusion on Appendix A .

C. The DEP should establish criteria for determining when a "use has been "actually attained."

Implicit in the DEP's proposal to add certain streams to Appendix A is a conclusion that one or two surveys with spotty data showing reproducing trout is sufficient to establish an "existing use" of "trout waters." This conclusion is reached without articulating the standard of proof necessary to establish when an "existing use" is "actually attained." To the best of our knowledge neither has the USEPA attempted to define the minimum level of use necessary to demonstrate that a use has been "actually attained." In the absence of federal or state guidance, the DEP has apparently adopted the opinion that any use, if observed on at least one occasion, means that the use has been "actually attained," at least with respect to "trout waters." The DEP's current approach will lead to confusion and unintended consequences and should be replaced.

In recent guidance to U.S. EPA Regional Offices concerning ways to improve the effectiveness of using use attainability analyses to make more defensible use designation/attainment decisions, the agency states that:

"Getting the uses right requires both a useful set of designated uses and an effective process for conducting credible and defensible UAAs. EPA realizes that deciding what uses are attainable is critical, and views the UAA process, properly applied and implemented, as a vital tool in making those decisions...UAAs are meant to assess what is attainable, it is not simply about document the current water quality condition and use (although document current conditions is often part of the analysis).".[2]

The DEP should establish guidelines for determining when an existing use is "actually attained." There are other programs administered by DEP, specifically, as noted above, the Baseline Water Quality requirement of the Antidegradation Program and the assessment portion of the TMDL program, that could provide guidance to the agency as it defines a standard for determining when a "use" is "actually attained." These other programs require any decision regarding the status of a stream to be based upon both an adequate number of data points and sound methodology in the way that the samples are collected. A comparable approach should be developed for establishing that a "use" has been "actually attained." By using this type of objective, scientific approach, the DEP would remove the subjectivity that seems to pervade "existing use" determinations reflected in this proposal.

D. West Virginia's "trout waters" are protected without the Appendix A list

Adding these 337 streams to the "trout waters" list at one time is unnecessary because "trout waters" can be and are protected through other means. Sec. 6.3.b of the water quality standards creates "Category B2 – Trout Waters." As stated in that section, this category "**includes** . . .trout waters as defined in Sec. 2.20" of the rule. 47 CSR 2-6.3.b (emphasis added). That section also states that the list of "trout waters" in Appendix A, is "a representative list," implying that it is not now, nor has it ever been a comprehensive list of all "trout waters" in the state. The DEP's "Briefing Document," supports this reading by noting that Appendix A is not an exhaustive list of all streams that fit the definition of "trout waters." DEP has stated on numerous occasions that streams that meet the definition set forth in Sec. 2.20 of the rule are "trout waters" and can and will be protected as such, regardless of whether the stream appears on Appendix A. The focus of the agency is not limited to the list in Appendix A, but instead

---

[2] Memo from Eprhraim S. King, Director of EPA Office of Science and Technology, to U.S. EPA Regions 1-10, March 13, 2006, Page 1

includes consideration of the water itself and whether it meets the definition of a "trout water." This case by case assessment of whether a stream qualifies as a trout water would occur during the process of permitting any new discharge to the stream. Thus, the protection afforded trout waters is not limited to the streams that appear on Appendix A.

E. DEP should solicit input from the public in the communities surrounding the streams proposed for inclusion on Appendix A

The Chamber believes that the DEP should make a greater effort to seek input on the proposed changes to Appendix A from citizens located in the areas surrounding these streams for two reasons. First, the paucity of information that exists for many of these streams mandates that further information be collected before a decision is made to add a stream. Citizens in the communities near these streams may be in the best position to provide that information. Second, because the listing of a stream will have a more direct affect on those who live near the stream in terms of future development in that area, these persons have greater motivation to gather the information necessary to add (or remove) a stream from Appendix A. For these reasons the Chamber recommends that the DEP hold a public hearing in the locale of any stream proposed for listing so that the local citizenry will have an opportunity to hear the agency's rationale for the listing and provide their comments.

We appreciate the opportunity to provide these comments and the efforts of the agency to maintain an up-to-date regulatory program.

Sincerely,

Thomas M. Bo[illegible]
Vice President
West Virginia Chamber of Commerce

cc: Stephen G. Roberts, President
Larry Emerson, Chair, Environment Committee

West Virginia Coal Association

PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

July 17, 2006

Ms. Lisa McClung
Director- Division of Water and Waste Management
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, WV 25304

Re: Comments on 2007 Triennial Review of Water Quality Standards

Dear Director McClung:

Pursuant to the notice published in the State Register by the West Virginia Department of Environmental Protection (WV DEP), the West Virginia Coal Association (WVCA) offers the following comments and observations regarding the agency's first triennial review of water quality standards.

WVCA is a non-profit state coal trade association representing the interests of the West Virginia coal industry on policy and regulation issues before various state and federal agencies that regulate coal extraction, processing, transportation and consumption. WVCA's primary goal is to enhance the viability of the West Virginia coal industry by supporting efficient and environmentally responsible coal extraction and processing through reasonable, equitable and achievable state and federal policy and regulation. WVCA appreciates the opportunity to provide comments to WV DEP regarding the proposed revisions to the state's water quality standards rule.

General Comments

WVCA is pleased that in the proposed rule WV DEP has moved to permanently codify the chronic aluminum criterion that was recently approved by the federal Environmental Protection Agency (EPA). As we detail in subsequent comments, the revised chronic aluminum standard properly reflects the level of scientific research that exists with respect to aluminum, reversing an ill-advised acceptance of a scientifically-deficient standard by the Environmental Quality Board (EQB) and ending a 10-year plus effort to revise the chronic aluminum criterion. With respect to Trout Streams, WVCA is concerned that the agency has proposed a massive expansion of these stream listings without providing the needed time for the regulated community to review and analyze the data for which the listing decisions are based.

Specific Comments

Aluminum

WVCA has actively participated in rulemaking initiatives with WV DEP, the EQB and the West Virginia Legislature regarding aluminum that have culminated with the recent approval by EPA of a revised chronic aluminum criterion for West Virginia. As in past rulemaking efforts, WVCA supports the revised aluminum criterion as approved by EPA and totally supports the current proposal to permanently codify the revision.

Previous comments and supporting documentation provided by WVCA to both WV DEP and the EQB detail the rulemaking history of aluminum in West Virginia and nationally, and support EPA's approval of the revised 750 ug/L chronic aluminum criterion. WVCA has attached copies of these original comments and asks the agency to consider them with respect to the current rulemaking effort.[1]

Trout Streams

WV DEP has proposed to massively expand the list of streams codified within the WQS rule as "trout streams". As noted in previous WVCA comments to this agency and the EQB, the permitting ramifications of classifying a water segment as trout stream are significant, with different water quality standards (uniformly more stringent) applying to trout streams. Incorrectly classifying a water segment as a trout stream will have serious economic and environmental ramifications for mining operations and mineral reserve holders situated in proximity to such streams, and every effort should be made by the agency to allow for a full and open review and dialogue on any proposed addition to the codified trout stream list. In its last triennial review, the EQB proposed a similar expansion of the trout stream list and provided only a 30-day comment period and no supporting evidence or documentation to justify the extension of the list. The West Virginia Legislature rejected the EQB's proposed expansion of the list.

[1] See generally WVCA's initial comments and supporting attachments as submitted in October 2005 to WV DEP regarding aluminum. Copy provided as attachment "1".

Under the current initiative, WV DEP has remedied at least one of these problems- the dissemination of evidence and documentation as maintained by the West Virginia Department of Natural Resources (WV DNR) that supposedly supports classifying water segment as a trout water. However, the agency has repeated another of EQB's blunders by failing to provide the regulated community with adequate time to review the supplied information.

In response to WV DEP's initial announcement that it would seek to expand the current list of trout streams, WVCA submitted a Freedom of Information Act (FOIA) request to WV DNR seeking the information supplied to WV DEP to support the planned expansion of the trout stream list. To date, we have received three responses to this request. The first arrived from WV DNR on May 12, 2006 and consisted of a one-page, cryptic description of the process used by that agency in classifying a water segment as a trout stream. This FOIA response contained no information on specific streams or stream segments. Information and data on specific streams arrived on June 12, 2006 in the form of FOIA response from WV DEP that contained raw data and collection sheets. Additionally, a second response to the FOIA request of May 2006 was provided on June 26, 2006 by WV DEP.

The initial FOIA response that contained actual tangible information from WV DEP was received 12 days AFTER the agency published the proposed rule for public comment and review on May 31, 2006. The latest FOIA response of June 26, 2006 was received a mere 20 calendar days before the July 17, 2006 close

of the comment period on the proposed rule and trout stream list. While WV DEP has remedied one of the previously-mentioned errors made by the EQB in its proposed expansion of the trout stream list by providing the underlying documentation to support a listing, the agency has still failed to provide adequate time for permittees and mineral or land holders to review and analyze that data in order to offer substantive comments through this rulemaking comment period. **WVCA urges the agency to further extend the review and comment period regarding the trout stream expansion**. Absent an extension of the comment period that will allow more time to review the supplied FOIA response information, the proposed expansion of the trout stream is no more defensible or justified than the earlier, similar initiative proposed by the EQB.

Respectfully Submitted,

Jason D. Bostic, Vice President
Regulatory & Technical Affairs

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

Ms. Gloria Shaffer
West Virginia Department of Environmental Protection
Division of Water and Waste Management-
Water Quality Standards Program
601 57th Street SE
Charleston, WV 25304

Via Electronic Mail: Gjshaffer@wvdep.org

Re: Comments on 2007 Triennial Review of Water Quality Standards

Dear Ms. Shaffer:

Pursuant to the September 22, 2005 announcement by the West Virginia Department of Environmental Protection (WV DEP), the West Virginia Coal Association (WVCA) offers the following comments and observations regarding the agency's first triennial review of water quality standards.

WVCA is a non-profit state coal trade association representing the interests of the West Virginia coal industry on policy and regulation issues before various state and federal agencies that regulate coal extraction, processing, transportation and consumption. WVCA's producing members account for 80 percent of the Mountain State's underground and surface coal production. WVCA also represents associate members that supply an array of services to the mining industry in West Virginia. WVCA's primary goal is to enhance the viability of the West Virginia coal industry by supporting efficient and environmentally

responsible coal removal and processing through reasonable, equitable and achievable state and federal policy and regulation. WVCA appreciates the opportunity to provide comments to WV DEP regarding revisions to water quality standards.

General Comments

Prior to the adoption of any water quality standard recommended by the federal Environmental Protection Agency (EPA), WV DEP must have a full understanding of the criteria's application to West Virginia. EPA requires that states only adopt criteria consistent with the agency's recommended standards—it does not require that states adopt all criteria. Wholesale adoption of federal standards by West Virginia in the past has resulted in state water quality standards that are inappropriate for conditions found in West Virginia and have spurred intensive rulemaking efforts to revise these standards (see subsequent comments regarding aluminum and selenium).

Blind acceptance of EPA standards has also placed West Virginia at an economic disadvantage with surrounding states that elected not to adopt certain criteria. Without understanding background water quality levels, geology, and other state-specific factors, adoption of EPA standards is risky to the stability of regulatory programs such as the TMDL program. Adoption of EPA standards absent scientific investigation as to the applicability of the standard also presents serious social and economic implications (coal mining and manganese, aluminum

and selenium) and fails to paint an accurate picture of the effect of proposed water quality standards for consideration by the public and policy makers. Collection of technical and economic data will also assist WV DEP in filing "Fiscal Notes" for proposed water quality standard changes as required by *W. Va. Code* §§29A-3-4, 22-11-2 and 22B-3-4(b).

WVCA encourages WV DEP to conduct scientific data collection with respect to any new criteria based on federal recommendations and to adequately survey NDPES permit holders as to the possible economic and technical aspects of any new criteria.

Specific Comments

Aluminum

The current aluminum criteria for West Virginia remains a serious concern for the West Virginia coal industry. WVCA supported an initiative through the West Virginia Legislature and the West Virginia Environmental Quality Board (EQB) to reexamine the chronic aluminum criterion. This initiative culminated in a proposed revision to the chronic aluminum criterion that was approved by the EQB and the Legislature and now awaits the approval of the federal Environmental Protection Agency (EPA). WVCA remains supportive of this revision, and encourages WV DEP to actively pursue its approval with EPA. Since the pending revision was promulgated by the EQB, WVCA feels it is necessary to submit substantive comments on the West Virginia aluminum

criterion to WV DEP, as the agency now charged with water quality standards development.

The EQB adopted EPA's aquatic life criteria for aluminum of 87 ug/L chronic and 750 ug/L acute with little or no scientific research or consideration of the criteria's applicability to West Virginia, setting in motion a 10-year effort to revise the state aluminum criteria.

In 1996, WV DEP presented data to the EQB demonstrating that several streams in West Virginia violated the aluminum standards of 87/750, yet they supported healthy and diverse fish and benthic populations. In addition to the WV DEP data, the EQB reviewed EPA's supporting scientific rationale for the chronic aluminum standard and determined that the criterion was scientifically flawed. Had the federal agency followed its own guidance for the development of water quality standards, the chronic aluminum criterion would be equal to the acute criterion of 750 ug/L.[1] The EQB collected information from other parties regarding aluminum, and during 1997 triennial review proposed deleting the chronic aluminum criterion from the state's water quality standards. The Legislature approved the revision and it was forwarded to EPA for approval.

Unfortunately, when the EQB staff prepared the rule package regarding deletion of the aquatic life criterion for aluminum, it failed to include the wealth of

[1] See generally Attachment "A", comments regarding the chronic aluminum criterion submitted to the EQB during the 1997 Triennial Review and attachment "B", comments submitted to the EQB in September, 2004.

scientific information reviewed by the Board members regarding the flawed nature of EPA's chronic criteria.[2] Instead, the EQB rationale referenced only concerns related to NPDES permits and the information supplied by WV DEP regarding state stream concentrations of aluminum. While these concerns were valid, failure to include scientific reference information regarding the unsound federal chronic criterion lead to EPA's disapproval of the chronic aluminum criterion deletion.

Recent experience in neighboring states illustrates that a properly-justified deletion of the chronic aluminum criterion that references the flawed basis of the standard can indeed gain EPA approval. In December 2000, Pennsylvania (through its agency, the Pennsylvania Department of Environmental Protection) rejected EPA's chronic aluminum criterion:

> **The Department believes that the chronic criterion of 87 ug/L should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies. The chronic studies described in the EPA's 1988 Ambient Water Quality Criteria for Aluminum document do not show a consistent pattern of toxicological response to the different exposure concentrations within or between the various tests described. The final chronic value developed following the EPA's procedures and based on available acute-chronic ratios is 750 ug/L, the same value as the acute criterion. However, the EPA then lowered the final chronic value to 87 ug/L, claiming it to be necessary to protect brook trout and striped bass. The EPA's justification for this was data derived from studies that EPA staff later described as data that should not be used for criteria development.**

[2] See Attachment "C", EQB rationale document dated July 7, 1998.

The Department cannot adopt the flawed chronic criterion for use in the Commonwealth without better justification.[3]

In August 2001, EPA Region III approved Pennsylvania's rejection of the chronic aluminum criterion:

> **Pennsylvania adopted the EPA recommendation for the protection of aquatic life from acute exposures but did not adopt EPA's chronic recommendation. The Department [Pennsylvania Department of Environmental Protection] that the federal aluminum chronic criterion of 87 ug/L should not be adopted because it is based on chronic toxicity test results that show inconsistencies within the tests and between studies, and it question [sic] the supporting data in which the chronic criterion has been based.**
>
> **The issues surrounding the chronic aluminum criterion are not new, and EPA Region III is not taking issue with Pennsylvania's lack of a criterion at this time. We do believe that the absence of the chronic criterion will be adversely affect [sic] threatened and endangered species in Pennsylvania. Our reasoning is that the two specific species that the chronic criterion was lowered to protect brook trout and stripped bass, are not threatened or endangered.** [4]

Following EPA's disapproval of West Virginia's deletion of the chronic aluminum criterion, rather than further pursuing the change with the added benefit of a properly justified rationale document, the EQB chose to proceed with changing the measure of aluminum from total to dissolved. This revision was approved by EPA, but it did not address the problems associated with the scientifically-deficient chronic aluminum criterion.

---

[3] See page 16 of Attachment "D", Pennsylvania water quality standards revisions as published in the Pennsylvania Bulletin.

[4] See Attachment "E", letter dated August 2, 2001 from Rebecca Hanmer, EPA Region III to David Hess, Pennsylvania Department of Environmental Protection.

In 2004 the West Virginia Legislature directed the EQB to revise the chronic aluminum criterion. Based on scientific information supplied to the EQB during the public comment process, the EQB again proposed a revision of the chronic aluminum criterion.[5] This change remains under review at EPA.

As stated earlier, WVCA supports the current revision that is undergoing review at EPA as an appropriate step toward a defensible aluminum criteria for West Virginia and urges WV DEP to interact with EPA regarding the standard's approval. However, should the current revision be rejected by EPA, problems with the chronic aluminum criterion will remain, requiring further examination and future revision by WV DEP.

Selenium

Several years ago the EQB adopted the federally-recommended criteria for selenium. Based on a review of the administrative record, it appears that the EQB adopted the criteria with no scientific research regarding the criteria's applicability to West Virginia. The 1987 criteria were largely based on selenium toxicity to fish in a large pond with extended water retention times. This is a vastly different environment than exists in the steeply-sloped terrain of West Virginia, and application of this lotic criteria to flowing streams is misplaced.

Since the selenium criteria was originally promulgated by EPA, further research and studies have been conducted that illustrate the flawed nature of the

[5] See generally Attachment "B", September 2004 comments to the EQB regarding revision of the chronic aluminum criterion.

criteria. EPA is currently in the process of revising the nationally-recommended selenium criteria.[6] Because of the flawed nature of the current selenium criteria and its inappropriate application to flowing waters in West Virginia, WVCA is supportive of this federal initiative. However, we caution WV DEP to fully analyze the appropriateness of applying any federally-revised standard in West Virginia. Available information seems to indicate that a state-specific selenium standard for West Virginia may be warranted, as fish populations appear to be healthy and diverse in streams with identified selenium concentrations.[7] The pressing nature of selenium also warrants that WV DEP investigate a state-specific criteria for West Virginia since the federal revisions remains pending. The agency has recently completed draft TMDL documents that impose selenium allocations based on the existing water quality criteria, and will continue to develop and implement selenium TMDLs, adding urgency to this important issue.

Trout Streams

In the EQB's last triennial review, it proposed adding some 400 streams to the list of Trout Waters contained in the water quality standards rule. The EQB allowed only a 30-day comment period on this major expansion of the Trout Waters list. The EQB proposal was based only on the recommendations of the

---

[6] See Attachment "F", October 29, 1999 Federal Register Notice published by EPA regarding revision of the selenium criteria and Attachment "G", December 17, 2004 Federal Register Notice announcing draft criteria and requesting public comments.

[7] See Attachment "H", relevant pages from comments filed by the National Mining Association and WVCA regarding the programmatic Mountaintop Mining/ Valley Fill Environmental Impact Statement and *Fish Communities and Their Responses to Environmental Factors in the Kanawha River Basin, West Virginia, Virginia, and North Carolina.* U.S. Geological Survey, 2001.

West Virginia Division of Natural Resources, with no accompanying data or information on whether or not the streams actually meet the requirements to be classified as trout waters. Based on the lack of information regarding the current status of the proposed trout waters and the limited opportunity for comment provided, the West Virginia Legislature rejected the revision.

The permitting ramifications of classifying streams as trout waters can be significant, as different water quality standards (uniformly more stringent) apply to trout streams. Incorrectly classifying a water as a trout stream can have serious economic impacts for property owners and NPDES dischargers along that streams and should not be taken lightly be WV DEP. Before the agency undertakes any effort as part of its 2007 triennial review to list any additional streams as trout waters, WV DEP should conduct scientific investigations of water quality and fish populations in order to ascertain if a water body meets the criteria required of a trout stream. The agency should also hold hearings in the communities where such streams are located to take comment from the persons most familiar with the conditions of these streams.

We appreciate the agency's consideration of these comments.

Respectfully Submitted,

Jason D. Bostic
West Virginia Coal Association

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

October 14, 2005

Triennial Review Comments

Attachment "A"

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

ATTORNEYS AT LAW

1000 TECHNOLOGY DRIVE, SUITE 1330
FAIRMONT, WEST VIRGINIA 26554
TELEPHONE 304-368-4000

105 W. BURKE STREET
MARTINSBURG, WEST VIRGINIA 25401
TELEPHONE 304-263-0836

206 SPRUCE STREET
MORGANTOWN, WEST VIRGINIA 26505
TELEPHONE 304-284-4013

600 QUARRIER STREET
POST OFFICE BOX 1386
CHARLESTON, WEST VIRGINIA 25325-1386
TELEPHONE 304-347-1100
FACSIMILE 304-343-2867

601 AVERY STREET
PARKERSBURG, WEST VIRGINIA 26102
TELEPHONE 304-485-8500

12TH FLOOR VINE CENTER TOWER
LEXINGTON, KENTUCKY 40507
TELEPHONE 606-225-8700

900 HEYBURN BUILDING
LOUISVILLE, KENTUCKY 40202
TELEPHONE 502-589-0500

WRITER'S DIRECT DIAL NUMBER
(304) 347-1726

E-MAIL
lknee@bowlesrice.com

July 21, 1997

Charles R. Jenkins, Chair
West Virginia Environmental Quality Board
1615 Washington Street, East
Charleston, West Virginia 25311

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

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

October 14, 2005

Triennial Review Comments

Attachment "B"

19 West Cork Street, Suite 102
Winchester, Virginia 22601
Telephone (540) 723-8877

101 South Queen Street
Martinsburg, West Virginia 25401
Telephone (304) 263-0836

7000 Hampton Center, Suite K
Morgantown, West Virginia 26505
Telephone (304) 285-2500

Bowles Rice McDavid Graff & Love LLP

ATTORNEYS AT LAW

600 Quarrier Street
Charleston, West Virginia 25301

Post Office Box 1386
Charleston, West Virginia 25325-1386
Telephone (304) 347-1100
www.bowlesrice.com

5th Floor, United Square
501 Avery Street
Parkersburg, West Virginia 26101
Telephone (304) 485-8500

333 West Vine Street, Suite 1201
Lexington, Kentucky 40507
Telephone (859) 225-8700

September 24, 2004

Jennie L. Henthorn
Telephone — (304) 347-1162
Facsimile — (304) 347-1196

E-Mail Address:
jhenthorn@bowlesrice.com

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

VIA HAND DELIVERY

Re: 46 CSR 1 – WV Water Quality Standards
Aluminum Criteria

Dear Dr. Snyder:

The West Virginia Coal Association, the West Virginia Chamber of Commerce, and the West Virginia Manufacturers Association (collectively the "Industry Groups") offer the following comments in response to the proposed revisions to the aluminum criteria set forth in 46 CSR 1, the West Virginia Water Quality Standards. In general, the Board has proposed to retain the chronic aluminum criterion of 87 ug/l for trout waters, and to suspend the chronic criterion on all other streams until July 4, 2007. Based on the discussions of the Board in its meeting, the suspension will allow interested parties to perform a study to prepare an appropriate chronic aquatic life criterion for West Virginia waters. The Industry Groups support the proposed revision to the chronic aluminum aquatic life criterion with two minor clarifications.

First, the Board's proposal states that the chronic criterion for waters other than trout streams shall be 750 ug/l until July 4, 2007. In effect, the Board has not suspended the chronic criterion, but instead has adopted an interim criterion which will be in place for less than three years. Accordingly, the term "suspension" is a misnomer for the Board's actions. The Industry Groups suggest that the footnote be reworded to indicate that its action is a temporary modification, not a suspension.

Second, the footnote does not mention the proposed scientific study to develop appropriate aluminum criteria for West Virginia. This proposed study was clearly an important factor in the Board's decision, and the Industry Groups believe that the text of the footnote should be revised to inform anyone who reviews the rule of the planned study so they might participate if they so choose. Importantly, the Industry Groups support a study to develop appropriate aluminum criteria for West Virginia and are willing to participate in the design and funding of the study.

To resolve these two concerns, the Industry Groups propose that the footnote be rewritten as follows:

> Until July 7, 2004, the aluminum criteria will be implemented as follows: the chronic aluminum criterion shall be 87 ug/l for trout waters (as defined in section 2.20 of this rule) and shall be 750 ug/l for all other waters of the State. The implementation of the interim criteria provides time for a study to develop aluminum criteria for waters of the State which are based upon sound science and are protective of aquatic life.

The Industry Groups support the Board's decision to retain the chronic criterion of 87 ug/l on trout streams. This support does not imply that the Industry Groups agree that 87 ug/l is a valid criterion for trout streams, but instead is a recognition that the sensitive nature of these streams warrant retaining the current criterion while scientifically justified aluminum criteria can be developed.

The Board has worked on the aluminum criteria for a number of years, and a wealth of information already exists within the Board's files on this topic. The Industry Groups and their member companies have submitted many comments since 1996 demonstrating the flawed science on which the current chronic criterion of 87 ug/l is based. Had EPA followed its own protocol for preparing aquatic life criteria, the chronic criterion would be equal to the acute criterion of 750 ug/l. Instead, EPA attempted to rely on an alternate method to establish the chronic criterion, relying on two studies based on brook trout and striped bass. EPA's reliance on these two studies has been criticized by numerous scientists and has been rejected by many States.

Earlier this summer, the Industry Groups submitted a detailed document containing a discussion of the flaws with the chronic criterion of 87 ug/l, a proposal for revision of the chronic aluminum criteria, treatises and toxicity studies related to aluminum, and stream data. The Industry Groups incorporate that document herein by reference. In addition, the West Virginia Division of Environmental Protection submitted detailed field data which demonstrates that many high quality waters in West Virginia contain more than 87 ug/l when either total recoverable or dissolved aluminum is measured. These streams show no impairment. However, based on the Board's current chronic aluminum criterion, these streams must be listed as impaired and scheduled for development of a Total Maximum Daily Load ("TMDL").

The Industry Groups acknowledge the concerns expressed during recent Board meetings regarding the protection of aquatic life from aluminum toxicity, especially in streams which are acidic either seasonally or continuously. However, the interim criterion is protective of warmwater species in waters which otherwise comply with WV water quality standards. The Industry Groups, as well as others, have described to the Board the effects of pH, hardness, and other factors on aluminum toxicity.

Recent studies on aluminum toxicity shows that it is the form and bioavailability of aluminum in the water column that determines its toxicity. Bioavailable aluminum acts as a gill toxicant to adult fish, and this toxicity is manifested primarily where the water column pH is low and the monomeric forms of aluminum are present. For streams which do not meet the pH criteria, either seasonally or continuously, the streams will be listed as impaired for pH. Aluminum toxicity would be secondary to the effect of low pH, which can be addressed as appropriate in a future TMDL.

In those streams that meet the West Virginia water quality criteria for pH, the aluminum in the stream generally is not bioavailable and is not toxic to aquatic life. Some of the leading scientists in aluminum research have documented the mitigating effects that water hardness,

dissolved organic matter, and other water quality characteristics have on aluminum toxicity. These water quality characteristics occur in many West Virginia streams. Since these factors are not taken into account in the current aluminum criteria, they provide additional protection for aquatic life. These mitigating factors may be important considerations in future studies to develop appropriate aluminum criteria.

Clearly, the Industry Groups and other commenters have provided the Board with information regarding countless studies which have been performed since 1988 regarding aluminum toxicity. Many of these studies focus on effects of aluminum in acidic waters. Others describe the mitigating effects of certain water quality characteristics on aluminum toxicity. Some recent studies have focused on aluminum toxicity in mixing zones caused by liming stations to mitigate manmade stream acidity. Scientists have also made significant effort to determine the subchronic effects of aluminum exposure.

Some studies support that the criteria should be higher based on mitigating water quality characteristics or toxicity tests conducted at circumneutral pH. Other studies argue the importance of subchronic effects of aluminum, especially based on specific stream conditions which occur in certain water bodies. The Industry Groups advocate the development of aluminum criteria which consider the entire realm of available data, taking into account both factors which limit aluminum toxicity as well as specific circumstances where additional protection might be required. However, this must be done systematically based upon EPA's approved methodology for preparing aluminum criteria. It is not appropriate to consider either one study or a group of studies in isolation.

Even if one were to adopt a chronic criterion based on a commercially or recreationally important species as outlined in the *Guidelines*, this must be done based on a "species mean chronic value" as set forth in EPA's *Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and Their Uses* (1985). A "species mean chronic value" is calculated by the geometric mean of **all** chronic values for the species, not based

on a single study or a subset of studies for that species. The *Guidelines* also specify that a Final Chronic Equation should be derived if the chronic toxicity of the material has been shown to be related to a water quality characteristic, such as hardness or particulate matter. A study, as advocated by DEP to the Board, is the appropriate mechanism to make these revisions.

In the notice of the proposed revisions to the aluminum criteria, the Board asked for input on two matters related to the revision. First, the Board has asked for input on whether the aluminum criteria are adequately protective of warmwater species if implemented as dissolved concentrations. The Industry Groups submitted comments in 1999 based on the work of Robert Gensemer, a national expert in aluminum, which demonstrate that the implementation of the aluminum criteria as dissolved concentrations is appropriate. Significantly, the Board based its proposal in part on the EPA-approved Wyoming aluminum criteria. Wyoming has recently proposed converting its criteria to dissolved concentrations, noting the lack of correlation in Wyoming streams between elevated total aluminum concentrations and aquatic life impairment. The Industry Groups submitted detailed information in their response document earlier this summer supporting the implementation of the aluminum criteria as dissolved concentrations.

In addition, the Board solicited comments on the effect of the proposed change on streams previously listed as impaired based on the 87 ug/l chronic criterion. DEP has discretion in managing its list of impaired streams, and the Industry Groups defer to DEP's assessment of this issue. However, many of these previously listed streams were also impaired for parameters other than aluminum, and therefore a TMDL must be prepared for these streams regardless of the aluminum criteria. On the other hand, as DEP described to the Board during prior meetings, the Board's current proposed action would prevent healthy streams from being improperly listed for aluminum until appropriate aluminum criteria can be prepared.

The Industry Groups appreciate the work of the Board in this matter and the efforts to prepare a simple, understandable "Statement of Circumstances Requiring Proposed Amendments" to accompany the proposed rule. However, we suggest that the "Statement" be

revised to contain a greater description of the science that has been presented to the Board which describes the reasons that the chronic criterion of 87 ug/l is invalid. Clearly, EPA has told the Board in the past of the importance of a scientific justification for a proposed change, and the Industry Groups believe that it is equally important to transmit this information to the Legislature so that it can make an informed decision. Attachment 1 to this letter contains a proposed Statement for inclusion with the rule package. Attachment 2 contains a proposed Rationale Document supporting the proposed revision, which is based in large part on the previous submittal by the Industry Groups in June 2004.

The Rationale Document contains a summary of the current EPA-approved aluminum criteria for all fifty States. This summary is based upon the information available on the EPA website and generally has not been confirmed by contacts to the States due to time constraints. In all, only nineteen states have adopted some form of aluminum criteria. Only five states have adopted both EPA's proposed chronic and acute criterion as total aluminum concentrations. Four additional states, including West Virginia, have adopted EPA's proposed chronic and acute aluminum concentrations as dissolved concentrations. The remaining ten states have a variety of different aluminum criteria. Of the remaining ten states, approximately five have adopted dissolved aluminum criteria, including Texas, Utah, and Missouri, which have no chronic criterion and an acute criterion of 750 ug/l or greater.[1]

Pennsylvania, which has an acute criterion of 750 ug/l, is the only state which borders West Virginia that has adopted an aluminum criterion. Pennsylvania and Delaware are the only other states in EPA Region 3 which have any aluminum criteria. Based on the information available on the EPA website, all of the state water quality standards discussed herein have been approved by EPA. Clearly, EPA has provided the States with broad discretion in establishing aluminum criteria.

[1] The number of states with dissolved criteria is an approximation, because it was not clear in some circumstances whether the standards were based on dissolved or total recoverable concentrations.

Finally, if the Board decides to submit the proposed revisions as an emergency rule, the Industry Groups ask that the Board submit the emergency rule to EPA for approval, rather than waiting for Legislative action on the corresponding proposed rule. This would allow for a more timely consideration of the revisions by EPA, and earlier implementation of the change should the revisions be approved by EPA. Attachment 3 contains EPA's approval of a DEP emergency rule in 1997. The approval was made contingent upon adoption of a final Legislative rule within six months of EPA's action.

Thank you for your continued interest and involvement in this matter. In the meantime, if you have any questions, please do not hesitate to contact me or any of the undersigned.

Very truly yours,

Jennie L. Henthorn

Jennie L. Henthorn
Environmental Chemist

Supported by:

West Virginia Coal Association

West Virginia Manufacturers Association

West Virginia Chamber of Commerce

cc: Allyn Turner, Director, DWWM

JLH/vls
1309901

ATTACHMENT 1

STATEMENT OF CIRCUMSTANCES REQUIRING PROPOSED AMENDMENTS

During its 2004 session, the West Virginia Legislature passed H.B. 4193, which mandates that the Environmental Quality Board (the "Board") shall, with the cooperation of the Department of Environmental Protection ("DEP") and the regulated community, propose an emergency and legislative rule to revise the aluminum criteria in the West Virginia Water Quality Standards, 46 CSR §1.

In response to this directive, the Board began consideration of the aquatic life aluminum criteria at its April 2004 meeting. The Board circulated a *Request for Information on Aluminum Water Quality Standard* asking for "information from all interested parties regarding appropriate aquatic life protection limits for aluminum." The Board received written comments from ten individuals and organizations, and heard oral comments from five speakers.

Based on the information presented, the Board agreed to propose a modification of the aluminum criteria by adding the following footnote to the current aluminum criteria:

> The current chronic aluminum standard of 87 ug/l will be suspended in all but trout waters until July 4, 2007. During the period of the suspension, the acute and chronic aquatic life values for aluminum are 750 ug/l.

The Board conducted a public comment period on the proposed modification. A public hearing on the proposed rule was conducted on September 15, 2004, and written comments were received until September 24, 2004.

Based on the comments received by the Board both in 2004 and in past triennial reviews, the Board believes that a modification of the aluminum criteria is appropriate in light of the questions regarding the scientific validity of the 87 ug/l chronic criterion proposed by US Environmental Protection Agency ("EPA"), the stream data presented by DEP, and the disparity between the current chronic criterion and the aluminum criteria adopted by other states, in particular those states surrounding West Virginia. This information is set forth in greater detail in the Board's Rationale Document. In consideration of public comments, the language of the footnote has been rewritten in the emergency rule and the proposed Legislative rule as follows:

> Until July 7, 2004, the aluminum criteria will be implemented as follows: the chronic aluminum criterion shall be 87 ug/l for trout waters (as defined in section 2.20 of this rule) and shall be 750 ug/l for all other waters of the State. The implementation of the interim criteria provides time for a study to develop aluminum criteria for waters of the State which are based upon sound science and are protective of aquatic life.

The aluminum criteria remain as dissolved concentrations. In 1999, the Board established that studies conducted in both the laboratory and in the field clearly demonstrate that the dissolved aluminum fraction is the toxic portion and that the particulate associated forms of aluminum are regarded as nontoxic. Thus, the most scientifically defensible alternative is to regulate only the dissolved (bioavailable) form of aluminum by establishing dissolved criteria.

Importantly, the current criteria do not address any of the water quality characteristics which exist in many West Virginia streams which mitigate aluminum toxicity. In addition, the EPA-approved method for dissolved aluminum measurements utilizes a 0.45 μm filter, which allows a considerable amount of particulate aluminum to pass through and therefore be included in the dissolved aluminum measurement. Most toxicity tests which measure a dissolved aluminum concentration utilize a 0.1 μm filter, which is a smaller portion of the total aluminum concentration.

A critical component of the Board's consideration is the study which has been planned to develop scientifically sound aluminum criteria for West Virginia. The modification to the aluminum criteria will allow all interested parties, including EPA, DEP, WV Division of Natural Resources, and all other interested parties, to develop and implement scientific studies to evaluate aquatic life effects of aluminum in state waters. However, the study must be completed in a timely manner. If no new criteria are promulgated on or before July 4, 2007, the chronic criterion of 87 ug/l will be reinstated for all waters of the State.

ATTACHMENT 2

WV ALUMINUM CRITERIA

Draft Rationale Document for
Proposed Amendments

September 24, 2004

TABLE OF CONTENTS

I. INTRODUCTION

During its 2004 session, the West Virginia Legislature passed H.B. 4193, which mandates that the Environmental Quality Board (the "Board") shall, with the cooperation of the Department of Environmental Protection ("DEP") and the regulated community, propose an emergency and legislative rule to revise the aluminum criteria in the West Virginia Water Quality Standards, 46 CSR §1.

In response to this directive, the Board began consideration of the aquatic life aluminum criteria at its April 2004 meeting. The Board circulated a *Request for Information on Aluminum Water Quality Standard* asking for "information from all interested parties regarding appropriate aquatic life protection limits for aluminum." The Board received written comments from ten individuals and organizations, and heard oral comments from five speakers.

Based on the information presented, the Board agreed to propose a modification of the aluminum criteria by adding the following footnote to the current aluminum criteria:

> The current chronic aluminum standard of 87 ug/l will be suspended in all but trout waters until July 4, 2007. During the period of the suspension, the acute and chronic aquatic life values for aluminum are 750 ug/l.

The Board conducted a public comment period on the proposed modification. A public hearing on the proposed rule was conducted on September 15, 2004, and written comments were received until September 24, 2004.

Based on the comments received by the Board both in 2004 and in past triennial reviews, the Board believes that a modification of the aluminum criteria is appropriate in light of the questions regarding the scientific validity of the 87 ug/l chronic criterion proposed by US EPA, the stream data presented by the Department of Environmental Protection, and the disparity between the current chronic criterion and the

aluminum criteria adopted by other states, in particular those states surrounding West Virginia. This information is set forth in greater detail in following sections of this Rationale Document. In consideration of public comments, the language of the footnote has been rewritten in the emergency rule and the proposed Legislative rule as follows:

> Until July 7, 2004, the aluminum criteria will be implemented as follows: the chronic aluminum criterion shall be 87 ug/l for trout waters (as defined in section 2.20 of this rule) and shall be 750 ug/l for all other waters of the State. The implementation of the interim criteria provides time for a study to develop aluminum criteria for waters of the State which are based upon sound science and are protective of aquatic life.

II. HISTORY OF THE WEST VIRGINIA ALUMINUM CRITERIA

In 1994, at the urging of the United States Environmental Protection Agency ("EPA"), West Virginia adopted EPA's proposed aluminum aquatic life criteria of 87 μg/l for chronic exposures and 750 μg/l for acute exposures. While these criteria were proposed by EPA as acid soluble concentrations, the Board adopted these standards as total concentrations to correspond to the method of measurement required for NPDES (water discharge) permits.

In 1996, DEP made a presentation to the Board regarding DEP stream data collected since 1990. This data indicated that 87.6% of all total aluminum samples collected (3,293 samples) from various streams throughout the state exceeded the Board's chronic aquatic life aluminum criterion of 87 μg/l total aluminum, and 28.5% of the stream samples exceeded the current acute aluminum aquatic life criterion of 750 μg/l total aluminum.

In its presentation, DEP outlined that although the chronic and often the acute aluminum criteria were exceeded, the majority of these streams support large, diverse and healthy populations of aquatic life. Using the Board's criteria in place at that time, DEP would have been required to place the vast majority of West Virginia's streams on the State's 303(d) list despite the fact that these streams are healthy. Further, DEP expressed its belief

that EPA's recommended acute and chronic aluminum criteria are overprotective and inappropriate for many streams in West Virginia.

DEP's original presentation provided the groundwork for the Board's reconsideration of its aluminum criteria. Based on this presentation, the Board requested additional data to support DEP's belief that streams were not being adversely affected by total aluminum concentrations in excess of the Board's criteria. In addition, the Board created an informal aluminum task force to evaluate available toxicity data on aluminum and possible alternative aluminum criteria.

During the 1997 triennial review, the Board reevaluated its aluminum criteria in detail. Much time was devoted during the Board's meetings to examining EPA's document setting forth its rationale for EPA's recommended aluminum criteria, as well as EPA's guidance document for preparing aquatic life water quality criteria. Based on this review, the Board determined that EPA's criteria were not scientifically justifiable. In fact, had EPA followed its own guidance document for preparing water quality criteria, the chronic aluminum criterion would be equal to the acute aluminum criterion of 750 µg/l.[1] Accordingly, the Board determined that EPA's recommended chronic aluminum criterion was technically deficient and should be removed from the state water quality standards.

This modification was approved by the West Virginia Legislature and was submitted to EPA for approval. However, the justification provided to the EPA for the deletion of the chronic criterion did not the detail of the large amount of science supporting the Board's decision to delete the chronic criterion. Instead, the rationale document submitted to EPA referred primarily to the large number of streams in West Virginia that violate the chronic criterion and the problems with issuing NPDES permits based upon the chronic criterion.

[1] The scientific justification for rejecting the chronic aluminum criterion is discussed in detail on pages 6 to 8 herein.

At the same time, DEP conducted its further study of the aluminum concentrations and aquatic life communities in West Virginia's streams. Following the Board's decision, DEP presented the results of its stream study to the Board in 1998. The study indicated that many streams in the State with total aluminum concentrations in excess of 87 µg/l support healthy benthic communities. In addition, the study indicated that most of the streams with total aluminum concentrations in excess of 87 µg/l had nondetectable or very low concentrations of dissolved aluminum.

In addition, the Board's informal work group continued its study of the Board's aluminum criteria. The research done by this work group clearly indicates that the dissolved fraction of the total aluminum concentration is the portion that is toxic to aquatic life.

On June 22, 1999, EPA Region III notified the Board that it was disapproving the Board's deletion of the chronic aluminum criterion. EPA stated that the Board had failed to provide EPA with a scientific rationale to support the deletion of the chronic criterion. EPA requested that the Board take one of the following actions: (1) readopt the chronic criterion of 87 µg/l total aluminum, or (2) adopt an alternative chronic criterion that is scientifically defensible.

In 1999, the Board considered its alternatives to address EPA's disapproval of its deletion of the chronic aluminum criterion. A number of commenters requested that the Board provide a scientific justification for the deletion of the chronic criterion, and adopt a chronic criterion of 750 µg/l. Other commenters requested that the Board adopt dissolved aluminum criteria. After considering its alternatives, the Board decided that it would adopt dissolved aluminum criteria in place of the technically deficient total recoverable aluminum criteria. This revision was approved by EPA.

III. LITERATURE REVIEW

The rationale for revision of the chronic aluminum criteria is based in part on an evaluation of the content and validity of the Criteria Document as well as a literature

review of recent studies performed regarding aluminum toxicity. The results of these efforts are outlined briefly in this section. The best scientific evidence demonstrates that, for streams which meet the West Virginia water quality standards for pH, a chronic criterion of 750 µg/l (0.75 mg/l) dissolved is scientifically justified and is protective of aquatic life.

A. EPA's Criteria Document

EPA's recommended aluminum criteria are set forth in EPA's *Ambient Aquatic Life Water Quality Criteria for Aluminum* (1988) ("Criteria Document"). During the 1997 triennial review, the Board received detailed comments demonstrating that EPA's chronic criterion of 87 µg/l is scientifically flawed.

In fact, EPA failed to follow its own guidance document, (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses* (1985). (the "Guidelines") for setting aquatic life criteria when it established the chronic aluminum criterion of 87 µg/l. If EPA had followed its guidance document, the chronic aluminum criterion would be equal to the acute criterion of 750 µg/l.

The data relied upon by EPA to justify the current chronic aluminum criterion of 87 µg/l is inadequate. Chronic criteria are typically calculated by determining the acute to 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 *Guidelines*, EPA may adopt the species mean 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 studies to set the chronic criterion. (Cleveland, et al, 1986, on brook trout); (Buckler, et al., 1987 on striped bass). EPA's reliance on these two studies is seriously misplaced.

First, and most importantly, the *Guidelines* specify that a Species Mean Chronic Value for a commercially or recreationally important species may be adopted as the chronic criterion in place of a calculated chronic value. Neither of the two studies relied upon by EPA report final chronic values for brook trout or striped bass, and therefore cannot justify adopting a lower chronic criterion.

Second, the two studies had significant quality assurance and quality control 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. The Guidelines require that "[q]uestionable data, whether published or unpublished, should not be used." The dilution water in the striped bass study caused considerable mortality to 11-day-old fish (26%) and the 13-day-old fish (20% to 100% based on pH). The dilution water in the brook trout study caused an 11 percent mortality of juvenile brook trout in the pH 7.0 control group, and a 7.5 percent mortality in the pH 5.7 control group. The brook trout study monitored water quality in modified flow-through proportional diluters only once per week, which is insufficient to ensure constant water quality in the test chambers. Water quality in the striped bass study was monitored only twice per week. In addition, the brook trout study used a 0.1 μm filter in the dissolved aluminum measurement, while the applicable EPA analytical method requires the use of a 0.45 μm filter. While the striped bass study does not specify the filter size used, it was performed by the same scientists at virtually the same time and likely also used a 0.1 μm filter. This likely resulted in significantly lower aluminum concentrations than if they had been measured with a 0.45 μm filter.

Third, the studies are internally inconsistent. For example, toxicity tests on 160 day-old striped bass experienced 100% mortality at 349 μg/l. However, 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. The brook trout study was based on two separate exposure scenarios. However, the control groups between the two scenarios experienced very different mortalities at the same background aluminum concentration and virtually identical pH (10.8% at pH 7.0; 1.0% at pH 6.9).

Fourth, while neither study reports a final chronic value, both studies indicate that concentrations of aluminum significantly higher than 87 μg/l did not cause mortality. The striped bass study noted a significantly greater mortality only when aluminum concentrations exceeded 292 μg/l. Concentrations of aluminum as high as 390 μg/l did not cause mortality in striped bass based on the age of the fish, and aluminum concentrations at the maximum exposure of 300 ug/l had no apparent mortality to brook trout eggs and larva at a circumneutral pH.

Finally, the two studies do not correspond well to natural conditions in West Virginia streams. These studies generally were performed with water of low pH and low hardness. The water in the toxicity tests would violate West Virginia's water quality criteria for pH. The water in the brook trout study had an average hardness of 25 mg/l $CaCO_3$, with only 3 mg/l Ca^{+2}. Based on the water preparation method in the striped bass study, the water would be practically devoid of hardness. Other studies demonstrate that hardness plays an important role in mitigating the toxicity of aluminum. Further discussion of this issue is provided on pages 10 to 12 herein.

A letter from Eder Associates to EPA providing additional detail on the problems with these two studies and EPA's May 10, 1996, response are provided in Attachment A. In its response, EPA stated, "Available data indicates that aluminum is less toxic in waters having more typical hardness and neutral or higher pH, than in soft acidic waters. We are hoping to obtain sufficient data to rigorously account for this phenomenon." To date, no such work has been completed by EPA.

B. Recent Studies on Aluminum Toxicity

When EPA published the Criteria Document, EPA's recommended aluminum criteria were based on the limited information available at that time. Since then, a significant amount of new research has been conducted on aluminum bioavailability and toxicity. A literature review of recent studies on aluminum toxicity shows that it is the form and bioavailability of aluminum in the water column that determines its toxicity.

Assessments of fish, benthic macroinvertebrates, and other aquatic biota conducted under the auspices of the National Acid Precipitation Assessment Program ("NAPAP") clearly document that the amount of total recoverable aluminum within a given stream provides no meaningful information regarding aluminum toxicity. Instead, it is the form and bioavailability of the metal in the water column combined with the relevant chemical properties of surface waters (e.g., pH, acid neutralizing capacity, etc.) that determine aluminum toxicity. NAPAP Report 9 (Current Status of Surface Water Acid-Base Chemistry) and Report 13 (Biological Changes in Surface Water Acid-Base Chemistry).

These reports also outline that the single most important chemical parameter that determines the toxicity of aluminum is pH. If a stream has a seasonal or continuously low pH (<5.5-6.0) and little buffering capacity, then the form of aluminum present in the water column will generally be bioavailable, and if present in a high enough concentration, toxic. However, at a pH in the range from 6.6 to 8.8, the form of aluminum in the water column is not generally bioavailable or toxic. In other words, in those streams that meet the West Virginia water quality criteria for pH, the aluminum is not in the stream is not bioavailable and is not toxic to aquatic life.

The NAPAP literature also shows that many acidic surface waters with pH <5.5 have elevated concentrations of the toxic form of aluminum (i.e., inorganic monomeric aluminum). NAPAP Report 9. The studies referenced in these reports also show that measurements of labile monomeric aluminum serve as better predictors of potential biotic effects than do total aluminum concentrations.

The sum of the three primary forms of aluminum that make up the inorganic monomeric aluminum include the aluminum hydroxide complexes [$Al(OH)^{+2}$ and $Al(OH)^{+3}$] and the free aluminum ion (Al^{+3}). However, inorganic monomeric aluminum is generally not present in the water column at a higher pH range. At a pH >6.0, the monomeric aluminum converts to an insoluble precipitate. This relationship between increasing inorganic monomeric aluminum concentrations at pH<6.0 and very low inorganic monomeric aluminum concentrations at pH>6.0 is documented by Wigington, et al. (1996).

A recent comprehensive literature review confirms previous studies documenting that bioavailable aluminum acts as a gill toxicant to adult fish, and that this toxicity is manifested where the water column pH is low and the monomeric forms of aluminum are present. (Gensemer 1999). Further, scientists now have a much greater understanding of the mechanisms that cause toxicity at the gill surface than they did back in 1988 when EPA last updated its aluminum criteria document. In a paper presented at the 20th Annual Meeting of the Society of Environmental Toxicology and Chemistry (1999), Gensemer et al. speculated that calcium-related hardness reduced aluminum toxicity by stabilizing fish gills by out- competing Al for binding sites on the epithelial membrane.

Gensemer's review of the bioavailability and toxicity of aluminum in aquatic environments provides more than adequate documentation of the effect of pH on aluminum toxicity and further explains the problems with the chronic criterion in the Criteria Document. Gensemer's research also demonstrates that the criteria should be established based on dissolved aluminum concentrations. Further, Gensemer suggests that EPA should update the Criteria Document to address the ameliorating effects that water hardness, dissolved organic matter, and other water quality characteristics have on aluminum toxicity. EPA should initiate a thorough and comprehensive review and update of its Criteria Document.

Gensemer's review references a 1996 literature review by Donald W. Sparling and T. Peter Lowe. The Sparling and Lowe summary provides a detailed review of toxicity studies performed on plants, invertebrates, fish, and wildlife. The literature review states,

"The toxicity of aluminum is intimately associated with pH in that the metal is soluble and biologically available in acidic (pH<5.5) soils and water but relatively innocuous in circumneutral (pH 5.5-7.5) conditions." The Sparling review indicates that aluminum toxicity is "greatly influenced by" alkalinity, acidity, calcium, dissolved organic carbon, and fluoride. Specifically, the Sparling review cites studies which indicate that small increases in calcium levels "can dramatically improve" alevin and adult survival of brown trout, brook trout, and rainbow trout when exposed to waters with low pH and elevated aluminum concentrations. The hardness-related protective mechanism was confirmed by Lyderson, et al. (2002), who tested the mitigating effect of ionic strength on the toxicity of aluminum in fish. Their study demonstrated that increasing the water ionic strength by adding Ca or Na reduced the toxic effect of aluminum. They concluded that Ca and Na mitigate the aluminum toxicity by their effect on the ability for aluminum to bind with the gill surface.

As set forth in the *Toxicology Profile for Aluminum* (1999), aluminum is the most abundant metal and third most abundant element, after oxygen and silicon, in the earth's crust. It is commonly found in soil, minerals, rocks, and clays. It also occurs as bauxite ore. Aluminum concentrations in soil can range from 0.07% by weight (700 ppm) up to and over 10% by weight (100,000 ppm). The typical concentration is around 7.1% by weight (71,000 ppm). *Most aluminum containing compounds do not dissolve much in water unless the water is acidic.*

Aluminum occurs ubiquitously in natural waters as a result of weathering of aluminum-containing clays, rocks, and minerals. The toxicological profile also states that aluminum can also be mobilized from terrestrial environments through acidification (e.g., seasonal snow melts, runoff into streams with low acid neutralizing capacity, or from acid mine drainage); however, at a pH>5.5, naturally occurring aluminum compounds exist predominantly in an undissolved form such as gibbsite, $Al(OH)_3$, or aluminosilicates. In the presence of high amounts of dissolved organic material, dissolved aluminum generally is not present in a form which will cause aquatic life impairment.

The toxicological profile also outlines study results conducted by Goenaga and Williams (1988), that, in general, decreasing the water pH (acidification) results in an increase in mobility of the monomeric (toxic) forms of aluminum. The predominant form at pH<4 is the hydrated trivalent aluminum ion. Between pH of 5 and 6, the predominant forms are $Al(OH)^{+2}$ and $Al(OH)_2^{+}$, while the solid $AL(OH)_3$ is most prevalent between pH 5.2 and 8.8 (Martell and Motekaitis 1989). The soluble species $Al(OH)_4^{-}$ is the predominant species above pH 9 and the only species above pH 10.

All available data indicates that bioavailable forms of aluminum at low pH can be toxic; however, aluminum is generally not going to be present in a toxic or bioavailable form in waters that are not violating the State's water quality standards for pH.

IV. OTHER STATE'S ALUMINUM CRITERIA

Attachment B provides a summary of the current EPA-approved aluminum criteria for all fifty States. This summary is based upon the information available on the EPA website and generally has not been confirmed by contacts to the States due to time constraints. In all, only nineteen states have adopted some form of aluminum criteria. Only five states have adopted both EPA's proposed chronic and acute criterion as total aluminum concentrations. Four additional states, including West Virginia, have adopted EPA's proposed chronic and acute aluminum concentrations as dissolved concentrations. The remaining ten states have a variety of different aluminum criteria. Of the remaining ten states, approximately five have adopted dissolved aluminum criteria, including Texas, Utah, and Missouri, which have no chronic criterion and an acute criterion of 750 ug/l or greater.[2]

Based on a survey of the states surrounding West Virginia and the EPA Region III states (collectively, Pennsylvania, Ohio, Kentucky, Virginia, Maryland, Delaware, and Washington, D.C.), only Pennsylvania and Delaware have adopted aluminum criteria. Delaware has adopted criteria of 87 μg/l total aluminum for chronic exposures and 750 μg/l for acute exposures. Pennsylvania has adopted a criterion of 750 μg/l for chronic exposures.

Importantly, Pennsylvania formally rejected the chronic criterion of 87 µg/l in 1999 because of the flawed science on which it is based. In 2001, EPA accepted Pennsylvania's rejection of the chronic criterion, stating specifically:

> Aluminum is considered a non-priority pollutant by EPA, and on that basis and the basis that EPA Region III recognizes the uncertainty surrounding the chronic aquatic life criteria, we will not recommend to the Administrator that she use her discretionary authority and promulgate the chronic aluminum aquatic life criterion at this time.

Copies of Pennsylvania's rationale for rejecting the chronic criterion and EPA's letter approving Pennsylvania's action are provided in Attachment C.

V. STREAM DATA

As mentioned previously, DEP's 2004 Draft Section 303(d) List includes 166 waters, comprising 2,090 stream miles, that are considered impaired pursuant to the chronic aluminum criteria. As presented to the Board in its past consideration of the aluminum criteria, many of the listed streams have thriving aquatic communities and have no physical signs of impairment.

The North Fork of the Cherry River, Cranberry River, Williams River, Cacapon River, Cheat River, Greenbrier River, and Opequon River are all listed on the draft 303(d) list because the dissolved aluminum concentrations exceed the chronic aluminum criterion. Yet all of these streams have a dissolved aluminum concentration below the 292 µg/l concentration determined to not cause toxicity in the cited brook trout or striped bass studies.

These streams have thriving aquatic communities. DEP has extensive benthic studies demonstrating the health of the aquatic systems. In addition, detailed fish studies have been performed on the Cheat River watershed. This data shows little correlation

[2] The number of states with dissolved criteria is an approximation, because it was not clear in some circumstances whether the standards were based on dissolved or total recoverable concentrations.

between aluminum concentration and fish population. *See* Attachment D, which is a scatter diagram prepared by Dr. Todd Petty, Assistant Professor of Fisheries, WVU, based on Index of Biologic Integrity ("IBI") scores and dissolved aluminum data for streams in the Cheat River watershed. As stated previously, this 303(d) listing will require DEP to prepare a TMDL for these streams, despite their thriving aquatic communities. Clearly, this will detract from DEP's ability to use its limited resources for developing TMDLs on streams with actual impairment.

Importantly, the majority of streams in the State have much higher calcium concentrations and hardness than used in the toxicity studies for brook trout and striped bass. Calcium and hardness have been demonstrated to ameliorate the effect of aluminum in low pH waters. Calcium has been demonstrated to reduce the loss of other salts which are essential to maintaining sodium and potassium levels in fish. Sodium and potassium are the most important salts in fish blood. They are integral to normal heart, nerve and muscle function. Many of the toxicity studies performed on brook trout and striped bass were performed in extremely soft water ($\leq$25 mg/l $CaCO_3$). DEP has collected extensive data for streams across the State as part of its monitoring network. A summary of data for streams with dissolved aluminum concentrations greater than 75 μg/l is provided in Attachment E.[3] The summary contains more than 350 streams which have at least one dissolved aluminum concentration above 87 μg/l. Only 48 of these streams on the summary list have calcium concentrations <10 mg/l or a calculated hardness less than 25 mg/l $CaCO_3$.

About half of the streams in the summary with dissolved aluminum concentrations above 87 μg/l are in compliance with West Virginia's pH criteria. The effect of aluminum is dependent on the pH of the stream. The recent toxicity studies on aluminum have demonstrated that aluminum exacerbates the stress of low pH on the aquatic environment. The streams with pH<6 are already out of compliance with the pH criteria and therefore must be considered for 303(d) listing regardless of the aluminum concentrations.

[3]The more thorough and extensive data review provided to the Board by DEP is incorporated herein by reference.

Importantly, the aluminum included in the dissolved aluminum measurement may not actually be dissolved. The EPA method for analysis of dissolved aluminum utilizes a 0.45 μm filter, while the brook trout study cited in the criteria document used a 0.1 um filter. Small suspended and colloidal particles are capable of passing through a 0.45 μm filter. While the Board has historically taken the position that compliance with water quality standards should be based upon an EPA-approved method, the difference in filter size clearly affects the comparability of sampling results in the toxicity studies cited in the EPA Rationale Document and the DEP stream sampling results used in the draft 303(d) list.

Extensive review of stream data was also performed as part of the 1999 review of the aluminum criteria. The data review indicated that streams with concentrations of dissolved aluminum above 750 μg/l tend to have impaired aquatic communities, and that **elevated dissolved aluminum concentrations above 750 μg/l were encountered exclusively in streams with pH<6 and which therefore violate the State's water quality criteria for pH.** Only 3% of the 204 total streams analyzed had dissolved aluminum concentrations in excess of 87 μg/l which could not be attributable to a low pH.

VI. CONCLUSION

Based on the comments received by the Board both in 2004 and in past triennial reviews, the Board believes that a modification of the aluminum criteria is appropriate in light of the questions regarding the scientific validity of the 87 ug/l chronic criterion proposed by US EPA, the stream data presented by the Department of Environmental Protection, and the disparity between the current chronic criterion and the aluminum criteria adopted by other states, in particular those states surrounding West Virginia.

The aluminum criteria remain as dissolved concentrations. In 1999, the Board established that studies conducted in both the laboratory and in the field clearly demonstrate that the dissolved aluminum fraction is the toxic portion and that the particulate associated forms of aluminum are regarded as nontoxic. Thus, the most scientifically defensible

alternative is to regulate only the dissolved (bioavailable) form of aluminum by establishing dissolved criteria.

Importantly, the current criteria do not address any of the water quality characteristics which exist in many West Virginia streams which mitigate aluminum toxicity. In addition, the EPA-approved method for dissolved aluminum measurements utilizes a 0.45 μm filter, which allows a considerable amount of particulate aluminum to pass through and therefore be included in the dissolved aluminum measurement. Most toxicity tests which measure a dissolved aluminum concentration utilize a 0.1 μm filter, which is a smaller portion of the total aluminum concentration.

A critical component of the Board's consideration is the study which has been planned to develop scientifically sound aluminum criteria for West Virginia. The modification to the aluminum criteria will allow all interested parties, including EPA, DEP, WV Division of Natural Resources, and all other interested parties, to develop and implement scientific studies to evaluate aquatic life effects of aluminum in state waters. However, the study must be completed in a timely manner. If no new criteria are promulgated on or before July 4, 2007, the chronic criterion of 87 ug/l will be reinstated for all waters of the State.

References

Buckler, D.R., *et al.*, Influence of pH on the Toxicity of Aluminum and Other Inorganic Contaminants to East Coast Striped Bass. Water Air Soil Pollut. 35 97-106, 1987.

Cleveland, L., *et al.*, Interactive Toxicity of Aluminum and Acidity to Early Life Stages of Brook Trout. Transactions of the American Fisheries Society. 115:610-620, 1986.

Gensemer, R.W. and Playle, R.C. The Bioavailability and Toxicity of Aluminum in Aquatic Environments. Critical Reviews in Environmental Science and Technology. 29(4):315-450, 1999.

Gensemer, R.W., R.C. Playle, W.A. Stubblefield and J.R. Hockett. 1999. Aluminum Bioavailability and Toxicity to Freshwater Biota at Circumneutral and Higher pH. 20th Annual Meeting of Society of Environmental Chemistry and Toxicology. Philadelphia

Goenaga X, Williams DJA. 1988. Aluminum speciation in surface waters from a Welsh upland area. Environ. Pollut. 52:131-149.

Lyderson, E., S. Oxnevad, K. Ostybe, R.A. Anderson, F. Bjerkely, L. A. Vollestad and A.B.S. Poleo. 2002. The Effect of Ionic Strength on the Toxicity of Aluminum to Atlantic Salmon (*Salmo salar)* Under Non-Steady State Chemical Conditions. J. Limnology, 61(1): 69-76.

Martell A. E., Mortekaitis R.J. 1989. Coordination chemistry and speciation of Al (III) in aqueous solution. In: Lewis T.E. ed. Environmental chemistry and toxicology of aluminum. Chelsea, MI: Lewis Publishers, Inc.

Muniz, I.P. and Leivstad, H. 1980. Acidification – effects on freshwater fish. In: Ecological Impact of Acid Precipitation: Proceedings of an International Conference, Sandfjord, Norway, March 11-14, 1980, pp. 84-92.

National Acid Precipitation Assessment Program, State of Science and Technology, Vol. II, 1990.

US Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Aluminum, July 1999.

Wigington, P.J., Jr., et al. 1996. Episodic Acidification of Small Streams in the Northeastern United States: Episodic Response Project. Ecological Applications, 6(2):374-388, 1996.

1310298

ATTACHMENT A

eder associates
environmental scientists and engineers

OFFICES:
Locust Valley, NY
Madison, WI
Ann Arbor, MI
Augusta, GA
Jacksonville, FL
Trenton, NJ
Tampa, FL

June 6, 1995
File #670-15

Margaret Stasokowski, Director
Health and Ecological Criteria Division
Mail Code 4304
United States Environmental Protection Agency
Washington, D.C. 20460

Re: Comments on the USEPA Ambient Water Quality Criteria for Aluminum

Dear Ms. Stasokowski:

This letter discusses the technical basis for USEPA's Ambient Water Quality Criteria for aluminum and suggests revisions to improve the technical justification for the criteria and its acceptance by the regulated community.

A paper mill that produces specialty fine papers retained us to evaluate a draft of its proposed NPDES permit renewal which includes a very strict aluminum limit. This mill and others in the industry use alum as a process chemical to produce high quality paper. The current stage of papermaking technology does not allow paper mills to eliminate aluminum without severe adverse impacts on product quality.

The chronic aluminum criteria (87 µg/ℓ) were developed from the USEPA report, "Ambient Water Quality Criteria for Aluminum - 1988", which, in turn, used the data and results from the paper, "Influence of pH on the Toxicity of Aluminum and Other Inorganic Contaminants to East Coast Striped Bass".[1] EPA's 87 µg/ℓ chronic criteria is based on the following assumptions from the Bucker paper:

- 160-day-old striped bass
- A pH of 6.5
- Seven-day test duration
- No mortality value

[1] Bucker, D.N., P.M. Mehrle, L. Cleveland, and F.J. Dwyer. 1987. "Influence of pH on the Toxicity of Aluminum and Other Inorganic Contaminants to East Coast Striped Bass." *Water, Air, and Soil Pollution*, 35: 97-106.

Continued . . .

480 FOREST AVE., P. O. BOX 707, LOCUST VALLEY, NEW YORK 11560-0707 • (516) 671-8440 • FAX

We reviewed this paper and noticed that the dilution water used for the test exhibited severe toxicity which, under reasonable scrutiny, would render the test results invalid, and that identical experiments yielded different toxicity results.

USEPA should reconsider and reevaluate the aluminum criteria and the technical basis used to develop the criteria, and how USEPA used the reports to justify the criteria. Papers published after the 1988 water quality criteria indicate the strong relationship between aluminum toxicity, pH, solids content, organic compounds, and hardness[2]. Many of these relationships were not taken into account and are not reflected in the criteria. USEPA should consider all relevant toxicity information, that aluminum is a very common and ubiquitous compound and that alum, an aluminum derivative, is a major industrial chemical, and review the aluminum toxicity issue to address the following:

- That its criteria are based on sound scientific data.
- That its criteria could be adjusted depending on site conditions.
- That the societal benefits derived from enforcing the criteria at least balance the cost burden.

The following aspects of our evaluation should be of interest to you:

- Table 1 shows the mortality of 11- and 13-day-old striped bass exposed to 0, 131, and 393 µg/ℓ of aluminum at pH values from 5.0 to 7.2. The dilution water itself caused a 28 percent mortality for 11-day-old fish at pH 7.2, and 100 percent mortality at pH 5.5. The dilution water also caused 20 percent mortality of 13-day-old fish at pH 7.2; 52 percent mortality at pH 6.5; and 100 percent mortality at pH 5.5.

---

[2] Curtis, L.R., and Seim, W.K. 1992. "Calcium and Organic Acids as Determinants of Aluminum Toxicity at Alkaline and Neutral pH." Final Report for the Aluminum Association, Inc.

Gundersen, D.T., Bustamam, S., Seim, W.K., and Curtis, L.R. 1994. "pH, Hardness, and Humic Acid Influence Aluminum Toxicity to Rainbow Trout *(Oncorhynchus mykiss)* in Weakly Alkaline Waters." *Can. J. Fish. Aquat. Sci.*, 51: 1345-1355.

Continued . . .

Margaret Stasokowski, Director
United States Environmental Protection Agency
June 6, 1995

These results indicate that the dilution water itself was very toxic to fish with the toxicity increasing at lower pH values without the addition of aluminum.

- Table 2 shows mortality data for 159- and 195-day-old striped bass exposed to 0 and 390 µg/ℓ of aluminum at pH values 5.5, 6.5, and 7.2. There were no fish mortalities at the 390 µg/ℓ concentration at pH values of 6.5 (the pH value used for the Water Quality Criteria) and 7.2. These conditions are similar to those used to develop the Water Quality Criteria, and show that an aluminum concentration as high as 390 µg/ℓ had no effect on fish mortality.

- Table 3 shows the mortality of 11-day-old striped bass exposed to a "logarithmic" series of aluminum concentrations. The dilution water itself, without aluminum, caused a 26 percent mortality at pH 7.2. Similar mortalities (approximately 26 percent) were observed at this pH at all aluminum concentrations from 0 to 179 µg/ℓ. The toxicity of the dilution water itself was confirmed at the lower pH-value tests.

  The test was also done on 160-day-old striped bass using the same dilution water. The dilution water did not cause any mortality at pH 7.2 and 6.5. At pH 6.5, an aluminum concentration of 174 µg/ℓ caused a 58 percent mortality, but a concentration of 87 µg/ℓ (the Water Quality Criteria value) caused 0 percent mortality. These results contradict the Table 2 results that show no mortality at a much higher aluminum concentration (390 µg/ℓ). The fact that the dilution water was not lethal to the older fish, notwithstanding, the test was effectively invalidated as a scientific method when the dilution water killed the juvenile fish.

- The dilution water used in the Bucker study was groundwater "purified" in a commercial water softener, then by reverse osmosis, and finally by an anionic, cationic, and mixed-bed ion exchange system. This water would be very soft and almost free of hardness, and can hardly characterize the general range of conditions in receiving waters. Recent tests show that hardness greatly affects aluminum toxicity, the lower the hardness, the higher the toxicity.

Continued . . .

USEPA used a questionable and perhaps invalid database to set the National Criteria because identical experiments by the same researcher using the same dilution water did not give similar results.

EPA's stated policy in deriving the aquatic life criteria[3] is as follows (underlined for emphasis):

> *"Questionable data, whether published or unpublished, should not be used. Examples would be data from tests that did not contain a control treatment, tests in which too many organisms in the control treatment died or showed signs of stress or disease, and tests in which distilled or deionized water was used as the dilution water without addition of additional salts."*
>
> *"Data should be rejected if obtained by using ... organisms that were previously exposed to substantial concentrations of the test material or other contaminants."*
>
> *"Questionable data, data on formulated mixtures and emulsified concentrations, and data obtained with nonresident species or previously exposed organisms may be used to provide auxiliary information but should not be used in the derivation of criteria."*

The conclusion to be drawn from USEPA's Criteria and Policy is that one invalidates the other. If the Policy stands, the Criteria cannot; if the Criteria stands, the Policy cannot.

Summary

- The Aluminum Water Quality Criteria must be based on representative receiving waters and the representative fish species. The dilution water must not be toxic.

---

[3] USEPA, 1994. "Appendix H: Derivation of the 1985 Aquatic Life Criteria," Water Quality Standards Handbook, Second Edition.

Continued . . .

- The pH in most U.S. receiving waters is in the range of near neutrality to basic. Aluminum toxicity depends on pH, and the criteria should be based on a neutral pH.

- In addition to pH, aluminum toxicity also depends on total suspended solids (TSS), total organic carbon (TOC), and hardness. Recent studies have shown that the higher the TSS, the TOC, and the hardness concentrations, the lower the aluminum toxicity. Aluminum adsorbs on solids, decreasing its availability in the dissolved fraction and only a part of the dissolved fraction is bioavailable. Studies at low pH values showed that calcium hardness can decrease the toxicity of aluminum. The tests used to set the National Criteria were conducted at low calcium hardness which increases the toxicity of aluminum. The aluminum criteria should be hardness dependent as are the other metals in the National Criteria.

- Metals toxicity relates to the dissolved fraction and EPA is issuing dissolved metals criteria using the dissolved metal concentrations measured during the same tests used to develop the National Criteria. Dissolved aluminum was not measured during these tests and a site-specific aluminum criterium cannot be developed applying the chemical translator ratio (CTR) used for other metals.

- The references cited in EPA's aluminum criteria document concluded that aluminum could be toxic to aquatic life. The regulated community does not object to discharge limits when they are based on sound scientific data that demonstrate the need for and benefit derived from the criteria. Establishing a criteria that does not provide any measurable environmental benefit, but raises compliance costs, cannot be justified. Alum, an aluminum-bearing chemical, is commonly used by municipalities to treat drinking water and by industry to treat process and effluent water. Establishing an unjustifiably low limit that cannot be achieved will surely have an adverse impact on the ability of the affected firms to survive in a competitive environment, especially when many firms operate at the brink of loss.

- In the absence of specific aluminum criteria, discharges must comply with acute and chronic toxicity limits. Since the toxicity tests would determine

Continued . . .

whether the effluent contains compounds toxic to aquatic life, the aluminum limit is effectively redundant. Chemicals may have synergistic, antagonistic, or additive effects which are indicated by toxicity tests. The effects of chemical-specific testing are generally unpredictable and the toxicity testing specified in permits should be the regulatory requirement.

I hope that these comments are useful in EPA's reevaluation of the aluminum criteria and in developing a criteria based on sound scientific evidence.

Please call if you have any questions or if you would like to discuss the aluminum criteria issues.

Very truly yours,

EDER ASSOCIATES

Kyriacos M. Pierides, Ph.D.
Project Engineer

KMP/bl

cc: C. Delos
B. Cleveland
L. Eder

BLI194

TABLE 1

MORTALITY (%) AND STANDARD DEVIATIONS, IN PARATHESES, OF STRIPED BASS EXPOSED TO Al AT VARIOUS pHs FOR SEVEN DAYS

Age and pH	Nominal Al Concentration, $\mu g/\ell$[a]		
	0	300	100
11 day-old			
7.2	28 (16)	100[b] (0)	–
5.5	100[b] (0)	100[b] (0)	–
5.0	100[b] (0)	100[b] (0)	–
13 day-old			
7.2	20 (11)	–	75[b] (20)
6.5	52[b] (20)	–	97[b] (5)
5.5	100[b] (0)	–	100[b] (0)

NOTES:

(a) Measured values averaged 130.9 percent of nominal.

(b) Significantly greater than pH 7.2 control treatment ($p \leq 0.05$).

TABLE 2

MORTALITY (%) AND STANDARD DEVIATIONS, IN PARATHESES, OF STRIPED BASS EXPOSED TO Al AT VARIOUS pHs FOR SEVEN DAYS

Age (days)	Nominal Al concentration ($\mu g/\ell$)[a] and pH					
	pH 7.2		pH 6.5		pH 5.5	
	0	300	0	300	0	300
159	0 (0)	0 (0)	0 (0)	0 (0)	22[b] (11)	100[b] (0)
195	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	100[b] (0)

NOTES:

(a) Measured values averaged 130.1 percent of nominal.

(b) Significantly greater than pH 7.2 control treatment ($p \leq 0.05$).

TABLE 3

MORTALITY (%) AND STANDARD DEVIATIONS, IN PARATHESES, OF STRIPED BASS EXPOSED TO Al AT VARIOUS pHs FOR SEVEN DAYS

Age and pH	Nominal Al concentration, µg/ℓ[a]					
	0	25	50	100	200	400
11 day-old						
7.2	26 (13)	16 (6)	20 (9)	14 (8)	26 (10)	96[b] (6)
6.5	21 (13)	58[b] (29)	80[b] 20	36[b] (12)	97[b] (7)	–
6.0	98[b] (4)	94[b] (15)	100[b] (0)	99[b] (2)	100[b] (0)	–
160 day-old						
7.2	0 (0)	0 (0)	0 (0)	0 (0)	2 (4)	100[b] (0)
6.5	0 (0)	8 (11)	0 (0)	0 (0)	58[b] (32)	–
6.0	2 (4)	0 (0)	38[b] (4)	98[b] (4)	100[b] (0)	–

NOTES:

(a) Measured values averaged 89.5 and 87.2 percent of nominal, for tests with 11- and 160-old fish, respectively.

(b) Significantly greater then pH 7.2 control treatment ($p \leq 0.05$).

BLI 194

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

MAY 10 1996

Kyriacos M. Pierides, Ph.D.
Eder Associates
Environmental Scientists and Engineers
480 Forest Avenue
P.O. Box 707
Locust Valley, NY 11560-0707

Dear Mr. Pierides:

Thank you for your letter of June 6, 1995, regarding the aquatic life criterion for aluminum. You have expressed concern about the appropriateness of the aluminum criterion, when applied to situations where the pH, hardness, and other water quality parameters differ from those occurring in toxicity tests used to set the criterion.

The basis for the aluminum criterion is presented in the "Ambient Water Quality Criteria for Aluminum - 1988" (EPA 440/5-86-008). If the Agency had relied on the toxicity tests tabulated in Tables 1 and 2 (and summarized in Table 3) of the document, the Final Chronic Value would have been 748 µg/L, as indicated on page 22. For the more sensitive species, all of the toxicity tests in Tables 1 and 2 were performed at hardness above 45 mg/L. A few of the tests were performed at pH 6.5-6.6. These test results, however, were averaged with other tests conducted at pH 7 or higher.

Table 6 of the document presents data from toxicity tests that were non-standard in some way, generally because the test duration, observed endpoint, or dilution water were unusual. As discussed on page 6 of the document, two sets of tests, by Cleveland et al. and by Buckler et al., using brook trout and striped bass, respectively, in very soft, acidic water (hardness <10-12, pH 6.5-6.6), indicated substantial toxicity occurring at concentrations around 170 µg/L, but little toxicity at 87 µg/L. To protect these recreationally or commercially important species, the Final Chronic Value was lowered to 87 µg/L, EPA's current chronic criterion.

Subsequent testing of rainbow trout by Don Mount, for the purpose of determining Water-Effect Ratios at certain sites, has tended to support the Cleveland et al. and Buckler et al. results, indicating substantially enhanced toxicity at very low hardness and pH. Consequently, we believe that the chronic criterion should ordinarily be appropriate for waters of such low hardness and pH, provided that the aluminum is

not occluded in or sorbed by minerals, clays, or sand, or other particulate matter, as discussed on page 11 of the criteria document.

Available data indicate that aluminum is less toxic in waters having more typical hardness and neutral or higher pH, than in soft acidic waters. We are hoping to obtain sufficient data to rigorously account for this phenomenon. We have been talking with Donald Mount and Dominic DiToro, who represent a consortium of dischargers interested in generating data that EPA can use to revise its aluminum criterion. We are hopeful that through this cooperative effort we will be able to produce a criterion that can be applied with confidence across a wider range of hardness and pH, without need for major site-specific criteria adjustments. If sufficient data are available to account for other water quality parameters, such as organic carbon, we will consider this information as well.

During the course of this work, we intend to maintain an open process, through which the public and the states can communicate their concerns and submit additional data for consideration. We will thus keep you informed about future progress on the aluminum criterion. If you have questions, do not hesitate to continue calling Charles Delos of my staff at 202-260-7039.

Sincerely,

Margaret J. Stasikowski, Director
Health and Ecological Criteria Division

ATTACHMENT B

Summary of State Aluminum Criteria

STATE	ALUMINUM ACUTE (ug/l)	ALUMINUM CHRONIC (ug/l)	DESCRIPTION OR QUALIFIERS
Region 1			
Connecticut	N/A	N/A	
Maine	N/A	N/A	
Massachusetts	N/A	N/A	
New Hampshire	750	87	
Rhode Island	750	87	for waters with pH between 6.5 and 9
Vermont	N/A	N/A	
Region 2			
New Jersey	750	87	for the Delaware River Estuary
New York	N/A	100	Ionic (dissolved)
Region 3			
Delaware	750	87	
Maryland	N/A	N/A	
Pennsylvania	750	N/A	
Virginia	N/A	N/A	
Washington, DC	N/A	N/A	
West Virginia	750	87	dissolved
Region 4			
Alabama	N/A	N/A	
Florida	N/A	N/A	
Ge	N/A	N/A	
Kentucky	N/A	N/A	
Mississippi	N/A	N/A	
North Carolina	N/A	N/A	
South Carolina	N/A	N/A	
Tennessee	N/A	N/A	
Region 5			
Illinois	N/A	N/A	
Indiana	N/A	N/A	
Michigan	N/A	N/A	
Minnesota	750	87	for Class 2A
	1072	125	for Class 2B
Ohio	N/A	N/A	
Wisconsin	N/A	N/A	
Region 6			
Arkansas	N/A	N/A	
Louisiana	N/A	N/A	
New Mexico	750	87	dissolved
Oklahoma	N/A	N/A	
Texas	991	N/A	dissolved
Region 7			
Iowa	1106	87	for coldwaters
	4539	388	for warmwaters
Kansas	N/A	N/A	
Missouri	750 ug/l	N/A	dissolved
Ne ka	750	87	dissolved

STATE	ALUMINUM		DESCRIPTION OR QUALIFIERS
	ACUTE	CHRONIC	
Region 8			
Colorado	750	87	dissolved
Montana	N/A	N/A	Has 3 temporary site specific WQS
North Dakota	N/A	N/A	
South Dakota	N/A	N/A	
Utah	750	87	dissolved; 87 ug/l will not apply when pH >1 and hardness > 50 ppm as CaCO3
Wyoming	750	87	87 ug/l will not apply when pH >7 and hardness > 50 ppm as CaCO3; proposed
			to convert to dissolved
Region 9			
Arizona	N/A	N/A	
California	N/A	N/A	has site specific site criteria
Hawaii	750	260	dissolved
Nevada	N/A	N/A	
Region 10			
Alaska	750	87	
Idaho	N/A	N/A	
Oregon	N/A	N/A	Not yet been approved by EPA
Washington	N/A	N/A	

ATTACHMENT C

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

AUG 0 2 2001

Honorable David E. Hess
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
P. O. Box 2063
Harrisburg, PA 17105-2063

Dear Secretary Hess:

The Pennsylvania Department of Environmental Protection (PADEP) finalized new and revised water quality standards by publishing the revised regulation in the *Pennsylvania Bulletin* on November 18, 2000. Pennsylvania's Independent Regulatory Review Commission had approved the new regulations on August 24, 2000. The Department of Environmental Protection's Office of Chief Counsel certified on December 13, 2000, that these regulatory changes were adopted pursuant to the Commonwealth's legal procedures, and that the Office of Attorney General and the Governor's Office of General Counsel had also approved the final regulatory changes for form and legality. The revised water quality standards and supporting material were forwarded to the United States Environmental Protection Agency (EPA) for review in accordance with Clean Water Act (CWA) Section 303(c)(2)(A) on December 15, 2000. This package was received by EPA Region III on December 20, 2000.

EPA Region III has completed its review of Pennsylvania's new or revised water quality standards. EPA hereby approves the Pennsylvania WQS submission as consistent with the requirements of the CWA and 40 CFR Part 131. EPA is impressed with the scope of this submission, and would like to commend especially the Department for its revisions to address the way that ambient concentrations and natural background levels are considered with regard to water quality criteria. EPA also appreciates Pennsylvania's change in rounding so that criteria are now rounded to two significant digits. Enclosures 1 (Chapter 93) and 2 (Chapter 16) to this letter list all sections of the new and revised regulations that are being approved in accordance with CWA Section 303(c)(3) and 40 CFR Part 131. Enclosure 3 provides additional detail on several approved provisions.

At this time, EPA is approving Pennsylvania's revision to its bacteria criteria, which are more stringent than its previous bacteria criteria and, therefore, consistent with Section 303(c) of the CWA requirements. However, the Commonwealth should be aware that in 1986, EPA published the *Ambient Water Quality Criteria for Bacteria*, which recommended that *Escherichia coli (E. coli)* and enterococci are the best indicators to determine potential risk from acute gastrointestinal disease. EPA is pursuing a national effort to have states adopt these indicators. In addition, the new Beach Act amendment to the CWA requires states with coastal and Great

Lakes waters to adopt these indicators by 2004. We ask that Pennsylvania enter into a management agreement with EPA Region III to accomplish this goal as soon as possible.

With its triennial review, Pennsylvania submitted the new Chapter 96 (Water Quality Standards Implementation) for our reference and general information, rather than for EPA review. As this chapter was not submitted for our review, we will not be approving or disapproving specific provisions. However, we do have several comments on this chapter that EPA will be providing to the Commonwealth under a separate letter.

As part of EPA's obligation under the Endangered Species Act (ESA), EPA prepared a biological evaluation to determine if our approval of the new and revised sections of the water quality standards will adversely affect threatened and endangered species and their critical habitat in Pennsylvania. Our biological evaluation found that our approval action would not adversely affect threatened or endangered species. We have shared this biological evaluation with the Fish and Wildlife Service and the National Marine Fisheries Service and they concurred with our finding on May 21, 2001 and May 15, 2001, respectively. We are enclosing a copy of the evaluation (Enclosure 4) for your information. The completion of the biological evaluation and concurrence from the Services fulfills our obligation under Section 7 of the ESA on this federal action.

We are looking forward to working with you and your staff on the management agreement regarding Pennsylvania's revisions to its bacteria criteria and on the Commonwealth's next triennial review. If you have any questions, please feel free to contact me or have your staff contact Cynthia Yu-Robinson at (215) 814-5557.

Sincerely,

Rebecca W. Hanmer

Rebecca W. Hanmer, Director
Water Protection Division

Enclosures (4)

cc: Larry Tropea (PADEP)
Terry Fabian (PADEP)
Fred Marrocco (PADEP)
Edward Brezina (PADEP)
Carol Young (PADEP)
David Densmore (US FWS)
Tim Goodger (NMFS)

EPA has decided to approve the Pennsylvania adoption of the aquatic life criterion for mercury as inorganic. The main basis for our decision is that, regardless of the form of the criterion that is specified, at this time all EPA-approved methods for monitoring mercury measure for total mercury. According to a March 16, 2001, letter from the Commonwealth, no translator procedures or other methodology is used to reduce the analytical monitoring results in any way. Therefore, EPA finds that Pennsylvania will be applying its mercury criterion in a protective manner.

We would like to continue discussions with Pennsylvania on this topic, and will pass along information as to the toxic effects of methyl mercury as it becomes available. Should additional methods become available which allow for distinguishing between total and inorganic mercury, EPA would revisit this approval.

Aquatic Life Aluminum

In 1994, EPA disapproved Pennsylvania's aluminum criteria. In order to address that disapproval, Pennsylvania adopted EPA's recommended aquatic life criterion for protection from acute exposures. EPA had requested that the Commonwealth adopt the chronic number as well, or provide a rationale as to why it did not. The Commonwealth did not adopt the chronic criterion, and in response expressed their discomfort with the EPA chronic recommendation, citing the chronic toxicity test results that showed inconsistencies within tests and between studies. Pennsylvania also objected to the lowering of the final chronic value based on the protection of brook trout and striped bass, noting that EPA had previously asserted that these data should not be used in the criterion development.

Aluminum is considered a non-priority pollutant by EPA, and on that basis and the basis that EPA Region III recognizes the uncertainty surrounding the chronic aquatic life criteria, we will not recommend to the Administrator that she use her discretionary authority and promulgate the chronic aluminum aquatic life criterion at this time. However, should additional information become available, or if there are indications that aquatic species in the Commonwealth are being impacted by chronic levels of aluminum, EPA Region III may reconsider this position.

Appendix A: Water Quality Criteria for Toxic Substances

With the exception of a few parameters noted below, this biological evaluation will not address the appropriateness of aquatic life criteria established based on EPA recommendations. All of these parameters will be considered under the national consultation on water quality criteria called for under the recent ESA MOA. As stated in the ESA MOA, separate consultation on criteria that are identical to or more stringent than the existing 304(a) criteria, will not be necessary, subject to requirements related to reinitiation of consultation under 50 CFR 402.16. EPA's approval action on these criteria is subject to revision based on the results of the consultation.

Aluminum

This criterion had been previously disapproved by EPA when it was located in Chapter 93. In order to address the disapproval, Pennsylvania adopted EPA's acute aquatic life recommendation in Chapter 16. Pennsylvania adopted the EPA recommendation for the protection of aquatic life from acute exposures (the appropriateness of the acute criterion will be addressed under the national consultation), but did not adopt EPA's chronic recommendation. The Department believes that the federal aluminum chronic criterion of 87ug/l should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies, and it question the supporting data on which the chronic criterion has been based. Pennsylvania indicates that the chronic studies described in the 1988 Ambient Water Quality Criteria for Aluminum do not reveal a consistent pattern of toxicological response to the different exposure concentrations within and/or between the various tests described, and that the final chronic value should be equal to the Criterion Maximum Concentration (CMC) since, based on available acute-chronic ratios, the final FACR should be 0.9958. According to EPA's criteria development guidance, the FACR cannot be less than two so that a final chronic value cannot exceed the CMC. However, EPA lowered the final chronic value to 87 ug/l, saying it was necessary to protect brook trout and striped bass.

The issues surrounding the chronic aluminum criterion are not new, and EPA Region III is not taking issue with Pennsylvania's lack of a criterion at this time. We do not believe that the absence of the chronic criterion will be adversely affect threatened and endangered species in Pennsylvania. Our reasoning is that the two specific species that the chronic criterion was lowered to protect, brook trout and striped bass, are not threatened or endangered. Also, if Pennsylvania finds that other species are being adversely effected by chronic exposures to aluminum, they could use the general criteria to develop a protective criterion.

Mercury

Pennsylvania has adopted EPA recommendations to protect aquatic life from mercury. EPA specifies in its *National Recommended Water Quality Criteria-Correction* (April 1999) that while the mercury criterion was developed based upon data for only inorganic mercury, it should be applied to total mercury. If not, depending upon the amount of organic mercury in the water

The Pennsylvania BULLETIN

RULES AND REGULATIONS

Title 25--ENVIRONMENTAL PROTECTION

ENVIRONMENTAL QUALITY BOARD

[25 PA. CODE CHS. 92, 93 AND 95--97]

Water Quality

[30 Pa.B. 6059]

The Environmental Quality Board (Board) is amending Chapters 92, 93, 95 and 97, and adding new Chapter 96, as set forth in Annex A. This notice is given under Board order at its meeting of June 20, 2000.

A. *Effective Date*

These amendments will be effective upon publication in the *Pennsylvania Bulletin* as final rulemaking.

B. *Contact Persons*

For further information on Chapters 92 and 97 (relating to National Pollutant Discharge Elimination System; and industrial wastes), contact Milton Lauch, Chief, Division of Wastewater Management, Bureau of Water Quality Management, 11th Floor, Rachel Carson State Office Building, P. O. Box 8465, Harrisburg, PA 17105-8465, (717) 787-8184, or William J. Gerlach and William S. Cummings, Jr., Assistant Counsels, Bureau of Regulatory Counsel, 9th Floor, Rachel Carson State Office Building, P. O. Box 8464, Harrisburg, PA 17105-8464, (717) 787-7060.

For further information on Chapters 93, 95 and 96 (relating to water quality standards; wastewater treatment requirements; and water quality standards implementation), contact Edward R. Brezina, Chief, Division of Water Quality Assessment and Standards, Bureau of Watershed Conservation, 10th Floor, Rachel Carson State Office Building, P. O. Box 8555, Harrisburg, PA 17105-8555, (717) 787-9637 or William J. Gerlach, Assistant Counsel, Bureau of Regulatory Counsel, 9th Floor, Rachel Carson State Office Building, P. O. Box 8464, Harrisburg, PA 17105-8464, (717) 787-7060.

Persons with a disability may use the AT&T Relay Service by calling (800) 654-5984 (TDD users) or (800) 654-5988 (voice users) and request that the call be relayed. These final-form regulations are available electronically through the Department of Environmental

Protection's (Department) website (http://www.dep.state.pa.us).

C. *Statutory Authority*

These amendments are made under the authority of the following acts: sections 5(b)(1) and 402 of The Clean Streams Law (35 P. S. §§ 691.5(b)(1) and 691.402) and section 1920-A of The Administrative Code of 1929 (71 P. S. § 510- 20), which grant to the Board the authority to develop and adopt rules and regulations to implement the provisions of The Clean Streams Law (35 P. S. §§ 691.1--691.1001).

D. *Background and Summary*

This final rulemaking revises water quality management regulations including Chapters 92, 93, 95 and 97, and creates a new Chapter 96 to incorporate Total Maximum Daily Loads (TMDLs) into the regulatory calculus, all as part of the Regulatory Basics Initiative (RBI). The RBI is a multistep process to evaluate regulations considering several factors including whether requirements are more stringent than Federal regulations without good reason; impose economic costs disproportionate to the environmental benefit; are prescriptive rather than performance-based; inhibit green technology and pollution prevention strategies; are obsolete or redundant; lack clarity; or are written in a way that causes significant noncompliance.

These regulatory revisions streamline and clarify regulatory requirements, update the regulations to be consistent with Federal regulatory changes where indicated, consolidate certain chapters, and preserve Pennsylvania-specific requirements to serve the citizens of this Commonwealth. These final-form regulations may affect persons who discharge wastewater into surface waters of this Commonwealth or otherwise conduct activities which may impact these waters.

The Air and Water Quality Technical Advisory Committee (AWQTAC) and its successor committee, the Water Resources Advisory Committee (WRAC), provided input on the proposed amendments. The proposal was adopted by the Board as proposed rulemaking at its June 16, 1998, meeting. The proposal appeared at 28 Pa.B. 4431 (August 29, 1998), with provisions for a 60-day public comment period and three public hearings. The public comment period concluded on October 28, 1998. In response to the public comments received on the proposal, the Department revised the proposal in the form of an Advance Notice of Final Rulemaking (ANFR) proposal. Notice of the availability of the ANFR appeared at 29 Pa.B. 4872 (September 18, 1999) with provisions for a public comment period open until November 17, 1999, and three public meetings/hearings. The Department received approximately 1,500 public comments on the ANFR. The comments received on the proposed regulations and on the draft final regulations are summarized in Section E of the Preamble.

The Board has considered all of the public comments received on both its proposed rulemaking and the Department's ANFR in preparing these final-form regulations. Those portions of the draft final-form regulations that would potentially affect agriculture were presented to the Agricultural Advisory Board (AAB) on February 16, 2000. Following the meeting, the AAB sent a letter to Secretary Seif in opposition to the existing regulatory requirements concerning public hearings for individual NPDES permit applications for existing concentrated animal feeding operations (CAFOs) in High Quality and Exceptional

Value Waters. The draft final-form regulations were discussed with and approved by WRAC on March 8, 2000. WRAC also submitted minutes of its meeting to document its comments on the regulations. The valuable input from the public and the collective knowledge and experience drawn from advisory committees and others on these proposals has been utilized to develop a regulation which carefully balances the needs of citizens and the regulated community in assuring the protection of this Commonwealth's waters.

E. *Summary of Comments and Responses on the Proposed Rulemaking and the ANFR*

These regulatory revisions streamline, clarify and consolidate the regulatory requirements. Specifically, Chapter 92 has been modified to incorporate portions from other chapters to address the permitting of wastewater discharges into surface waters. The water quality standards implementation provisions in Chapter 93 and portions of Chapter 95 are moved to Chapters 96 and 92, as appropriate. Chapter 96 incorporates existing and modified provisions of Chapters 93, 95 and 97, and includes language describing TMDLs and individual water quality-based effluent limitations. The provisions of Chapter 97 have been relocated to Chapters 92, 95 and 96.

The preamble to the proposed rulemaking asked for comment on three specific issues. 1) A few comments were received on the question of additional public participation for NPDES permitting. The comments were split on the issue, and no change has been made to the current requirements. 2) The question of whether or not the potable water supply use should continue to be a Statewide use, or if it should be changed so that applicable water quality criteria are only applied at existing or planned potable water supply intakes, received several comments on both sides. Some comments stated that additional burdens were placed on dischargers to meet criteria more stringent than necessary, and other comments believed that protection of human health and water supplies were the most important factors in the decision. Based on an analysis of public comments and on the basis that the potable water supply use has been protected Statewide for many years and will impose no new requirements on dischargers, no change is being made to the potable water supply use, and the current language is retained. 3) No one commented on the request seeking alternative methods of analysis for color.

Because portions of this regulatory package constitute the Triennial Review of Water Quality Standards mandated by Environmental Protection Agency (EPA) regulations in 40 CFR Part 131 (relating to water quality standards), the following considerations were made. Part of the review requires that states reexamine waterbody segments that do not meet the fishable or swimmable uses specified in section 101(a)(2) of the Federal Clean Water Act (33 U.S.C.A. § 1251(a)(2)). The Department evaluated the two waterbodies where the uses are not met: (1) the Harbor Basin and entrance channel to Outer Erie Harbor/ Presque Isle Bay and (2) several zones in the Delaware Estuary.

The swimmable use designation was deleted from the Harbor Basin and entrance channel demarcated by United States Coast Guard buoys and channel markers on Outer Erie Harbor/Presque Isle Bay because boat and shipping traffic pose a serious safety hazard in this area. This decision was based on a use attainability study in 1985. Because the same conditions exist today, no change to the designated use for Outer Erie Harbor/Presque Isle Bay is made.

The Department cooperated with the Delaware River Basin Commission (DRBC), EPA and other DRBC signatory states on a comprehensive use attainability study in the lower

Delaware River and Delaware Estuary. This study resulted in appropriate recommendations relating to the swimmable use, which the DRBC included in water use classifications and water quality criteria for portions of the tidal Delaware River in May 1991. Criteria for enterococcus and changes in application to the fecal coliform criteria in this area reflect the use. The changes were incorporated into §§ 93.9e and 93.9g (relating to Drainage Lists E and G) in 1994. The primary water contact use remains excluded from the designated uses for river miles 108.4 to 81.8 because of continuing significant impacts from combined sewer overflows.

The Department is also incorporating §§ 92.8a(c), 92.13(b), 92.21(b)(5) and 92.55 into its water quality standards. This clarifies the Department's ability to incorporate schedules of compliance in NPDES permits when a Federal statutory deadline has passed pursuant to the decision in *In the Matter of Star-Kist Caribe, Inc.*, NPDES Appeal No. 88-5, 1990 NPDES LEXIS 4 (April 16, 1990).

In addition, an error in § 93.9p (relating to Drainage List P) for Tunungwant Creek in McKean County, which states that the water contact sport use (WC) should be deleted for the main stem portion from the confluence of the East and West Branches to the PA-NY State border, has been corrected. The Department conducted a use attainability study for Tunungwant Creek in 1985 and concluded that, while there were existing land use and man-made activities adversely affecting the quality of water and limiting recreational uses in the stream, these man-induced conditions were not considered irretrievable. Accordingly, the water contact sports use was added as a designated use to Tunungwant Creek at the November 15, 1988, Board meeting, and this final-form rulemaking was published at 17 Pa.B. 968 (March 11, 1989). This regulatory revision was not, however, incorporated into the *Pennsylvania Code* until now.

A detailed description of the revisions to the proposal by chapter and section follows:

General

Many comments objected that the proposal weakened water quality protection in this Commonwealth and that the comment period was insufficient to address the wide scope of changes. In response, the Department prepared an ANFR and offered an additional comment period and a series of three public informational meetings and public hearings. The change of most concern in Chapter 92 was § 92.81(a)(5) (relating to toxic or hazardous pollutants and general NPDES permits). In response to comments, the current language of the section, prohibiting the use of general NPDES permits in High Quality and Exceptional Value Waters, is retained.

Other comments suggested that the Department should make its water quality standards more stringent than Federal regulations or as stringent as practicable. The RBI only allows for more stringent standards when a compelling state interest is established.

A commentator stated that State regulations cannot become effective until receipt of EPA approval, based on a Federal case in Alaska. First, this case applied only to water quality standards, and not other State regulations which regulate water quality in some way, such as implementation regulations. Moreover, the Commonwealth has the duty and obligation under State statutes to promulgate and implement regulations, including water quality standards regulations, to protect this Commonwealth's water quality regardless of Federal

action, delay or inaction. The revisions to the Federal regulations which became final on April 27, 2000 (64 Fed. Reg. 37072) only apply to water quality standards "for Clean Water Act" (CWA) purposes. The Commonwealth will continue to issue NPDES permits based on the best available scientific information in its water quality standards, which may or may not be included in a water quality standards regulation approved by the EPA for CWA purposes. The Department, not the EPA, must defend the permits it issues in this Commonwealth, and has an obligation to apply applicable State water quality standards regulations in issuing the permits. The EPA has the legal right to object to an NPDES permit if they believe the state water quality standard used as a basis for the permit limit is insufficient for CWA purposes.

Concern was expressed that the public comment period was insufficient. The Department provided an additional 60-day public comment period following the 30-day comment period to obtain additional input on the regulations. Over 300 commentators took advantage of the extended comment period.

Chapter 92. National Pollutant Discharge Elimination System

The provisions of this chapter incorporate by reference portions of Federal regulations. This was done to limit the verbatim transfer of lengthy Federal regulations into this chapter. For this reason, it may be necessary for permittees to refer to Chapter 92 and 40 CFR Parts 122, 124 and 125 (relating to EPA administered permit programs: the National Pollutant Discharge Elimination System; procedures for decisionmaking; and criteria and standards for the National Pollutant Discharge Elimination System) to determine applicable requirements.

§ 92.1. Definitions.

The following definitions contained in the proposal were deleted in the final-form regulations: "average annual discharge limitation," "average monthly discharge limitation," "average weekly discharge limitation," "bypass," "complete application," "LA-Load allocation," "loading capacity," "major facility," "natural quality," "operator," "owner," "separate storm sewer overflow," "TMDL" and "WLA-Wasteload allocation." Deletions were based on comments received regarding the need for or clarity of these definitions.

Definitions for "agricultural operation," "AEU--animal equivalent unit (AEU)," "CAO--concentrated animal operation," "indirect discharger," "intermittent stream," "perennial stream" and "small municipal separate storm sewer system" were added and the proposed definition of "CAFO--concentrated animal feeding operation" was modified based on comments recommending that the Department's CAFO Strategy be incorporated in the final-form regulations.

Commentators recommended that a number of definitions be modified to be more consistent with Federal definitions. A number of definitions were modified in the final rule as follows:

The definition of "BAT--Best available technology" was modified to make the definition more consistent with the Federal definition.

The definition of "BMPs--Best Management Practices" was modified by deleting the

phrase "pollution prevention measures; source reduction procedures; water conservation practices; erosion and sedimentation control plans, stormwater management measures; and" to be more consistent with the Federal definition.

The definition of "conventional pollutant" has been modified by deleting "nitrites, nitrate nitrogen and phosphorous" to make the definition consistent with the Federal definition.

The term "facility or activity" is modified to be consistent with the Federal definition.

The word "used" has been deleted from the definition of "effluent limitation guideline" to make the definition consistent with the Federal definition.

The eight permit categories listed within the definition of "point source" were deleted to simplify the definition. The word "or" was deleted and "and" inserted in lieu thereof to make the definition more consistent with the Federal definition.

Commentators proposed revisions to definitions for clarity. The following changes were made to definitions in the final-form regulations:

The definition of "CCW--Contact cooling water" was amended by deleting the phrase ", or which otherwise has the potential to become contaminated" because it was unclear.

The definition of "CSO--Combined sewer overflow" was amended to make it clear that these overflows occur "prior to reaching the headworks of the sewage treatment facility."

Definitions for "intermittent stream" and "perennial stream" were added because these terms are used in the definition of surface waters.

The definition of "NPDES reporting form" is clarified by deleting "which includes" from the definition and adding "and" in lieu thereof.

The last sentence in the definition of "process wastewater" was deleted as unnecessary.

The definition of "stormwater discharges associated with construction activities" was revised to provide consistency with the definition of "NPDES permit for stormwater discharges associated with construction activities" in § 102.1 (relating to definitions).

Recommended changes to the definitions of "best available technology," "applicable effluent limitations" and "toxic pollutant" were not made because the definitions are based on Federal definitions.

§ 92.2. Incorporation of Federal regulations by reference.

A commentator stated that incorporation of Federal regulations by reference violates State law. This practice is not a violation of any State law and has been done before.

In response to comments requesting clarity, the last sentence of § 92.2(a) (relating to incorporation of Federal regulations by reference) has been deleted and new language added to clarify that if there is a conflict among Federal and State regulatory provisions, the provision in Chapter 92 shall be used unless the Federal provision is more stringent.

A typographical error was corrected by changing "(h)(1)" to "(h), (i)(2), (j), (k), (l)" in subsection (b)(5).

In response to comments received, subsection (b)(6) was deleted in the final-form regulations to incorporate the Department's CAFO Strategy into the regulations. The Federal references are inconsistent with the strategy.

Several commentators suggested sections of the Federal regulations that should have been incorporated by reference because they are not addressed in Chapter 92. Subsection (b)(19), (22) and (23) was added in the final-form regulations to identify these additional Federal provisions incorporated by reference.

Commentators questioned the meaning of the qualifying term "substantive and procedural." Subsection (c) was amended in the final-form regulations by deleting the words "substantive or procedural" to make the section more clear.

§ 92.2a. Treatment requirements.

Subsection (a) was modified in the final-form regulations by deleting the last sentence limiting treatment requirements and effluent limits to those established under the Federal Clean Water Act (33 U.S.C.A. §§ 1251--1376).

Commentators questioned the protection of threatened species not yet listed in the Pennsylvania Natural Diversity Inventory but included on Federal listings. The reference to the "Pennsylvania Natural Diversity Inventory" (PNDI) in subsection (c) has been deleted to allow for consideration of threatened species not yet included on that list, but established as threatened when someone identifies and documents the presence of these to the Department. The PNDI will still be used as the source of information for threatened species in this Commonwealth.

§ 92.2b. Pollution prevention.

The proposed pollution prevention amendments were deleted based on comments questioning the inclusion of guidelines that are not regulatory requirements, and the potential for these recommendations to take on regulatory meaning. This section was revised to provide that the Department will encourage pollution prevention and provide assistance to permittees in the consideration of pollution prevention measures. Comments were received opposing this change during the ANFR comment period. Commentators stated that the change weakened the regulations. The changes to this section proposed during the ANFR were retained in the final-form regulations. The Department believes that the regulations should place the burden of encouraging pollution prevention on the Department and that this program functions best when a voluntary approach is used. Recommendations related to pollution prevention activities for permittees are not appropriate for regulation. The language in this section is based on language in recent revisions to Chapter 91 that became effective on January 29, 2000. See 30 Pa.B. 521 (January 29, 2000).

§ 92.2c. Minimum Sewage and Industrial Waste Treatment Requirement.

Subsection (a) was modified to specify that secondary treatment is applicable to all

sewage discharges, except sanitary sewer overflows (SSOs) which are prohibited in accordance with § 92.73(8), and combined sewer overflows (CSOs), which need not attain secondary treatment if they implement Department-approved nine minimum controls (NMCs) and a long-term control plan (LTCP).

The phrase "after direct application or encouragement of pollution prevention approaches, including in-process recycling and reuse" was deleted in subsection (b)(4) to be consistent with the changes to § 92.2b, relating to pollution prevention. Additionally, subsection (b)(4) was changed to reference and clarify the applicability of provisions for quality standards and oil-bearing wastewater to NPDES discharges.

A new subsection (c), providing a cross reference to § 95.2 (relating to quality standards and oil-bearing wastewaters) has been added to the final-form regulations. This change was not included in the proposed rulemaking.

§ 92.2d. Technology-based standards.

Paragraph (3)(i)(C) is modified in the final-form regulations by deleting the phrase "other pollution prevention approaches" to be consistent with the changes made to § 92.2b discussed previously.

Some commentators supported the retention of 0.5 mg/l effluent limitation for discharges of total residual chlorine while others felt the regulations were too stringent and suggested a lesser residual chlorine limit. Others objected to the dechlorination provisions in paragraph (3)(iii) in special protection waters. These provisions were modified in the final-form regulations as a result of terminology changes in the Department's antidegradation regulations in § 93.4c(b)(1)(iii).

There were objections to the transfer of provisions from Chapter 97 to Chapter 92 regarding oils creating a sheen. These provisions were determined to apply to both NPDES and non-NPDES discharges and were consequently moved to Chapter 95 in the final-form regulations. A reference to § 95.2 was added to paragraph (4) of the final-form regulations. Comments were received in support of this change.

§ 92.4. Exclusions from Permit Requirements.

There was a request that natural gas and oil producing activities receive a permit exemption because it was asserted that these operations are similar to agricultural and silviculture activities that have such a permit exemption. The exemptions are based on Federal regulations and they do not include oil and gas producing activities. The change was not made.

A commentator objected to the proposed pollution prevention language in subsection (a)(6). The phrase was deleted for reasons described in a response related to § 92.2b. Other clarifying changes were also made to this provision.

§ 92.5a. Concentrated animal feeding operations.

As proposed, this section would have authorized a "permit by rule" for CAFOs meeting certain requirements. The Department issued a "Final Strategy for Meeting Federal

Requirements for Controlling the Water Quality Impacts of Concentrated Animal Feeding Operations" in March 1999. A notice of the availability of that strategy was published at 29 Pa.B. 1439 (March 13, 1999). The strategy does not provide for coverage under a permit by rule. Commentators recommended incorporation of the final strategy into the regulations. Accordingly, the proposed language of § 92.5a was deleted and replaced in the final-form regulations with regulations consistent with the published strategy.

§ 92.6a. Persons required to apply.

The proposed language was supported by one commentator, while another recommended it be changed to require the person with financial control over the operation to be the permittee. This entire provision was deleted in the final-form regulations as unnecessary. The Department will continue to permit persons with point source discharges, which includes owners, operators and others, as appropriate, as it has done for many years.

§ 92.7. New or increased discharges or change of wastestreams.

The final-form regulations replace the word "director" with the word "Department" for clarity. Commentators objected to the lack of clarity of the phrase "or which would include any new pollutant not covered by the NPDES permit" at the end of the last sentence in the section as part of the ANFR. The language has been amended in the final-form regulations to more clearly limit this requirement to those pollutants not identified in a previous permit application.

§ 92.8a. Changes in treatment requirements.

The proposed pollution prevention language in the last sentences of subsections (a) and (b) has been deleted to be consistent with the changes made to § 92.2b.

A commentator asserted that the provisions of subsection (a) are violations of due process protections, more stringent than Federal regulations and beyond the power of the Department. This provision was transferred intact from two other chapters that were previously approved as to form and legality by the Office of the Attorney General. Actions taken under these provisions may be appealable to the Environmental Hearing Board (EHB). The provisions were retained in the final-form regulations.

Commentators expressed concern regarding the proposed 90-day time period to complete an extensive report. They suggested 180 days and opposed the language allowing the Department to unilaterally shorten the time frame without any regulatory restraints or procedures. Subsection (b) has been modified in the final-form regulations rule to increase the time allowed for submission of the required report from 90 to 180 days. In addition, the phrase "or within a lesser period as the Department may specify" was deleted. The last part of the following sentence was also changed to ensure consistency with a previous reference in the sentence to water quality standards by inserting the word "standards" following the phrase "water quality."

A commentator was concerned that this section did not include authority to impose permit modifications with compliance schedules. Subsection (c) was modified in the final-form regulations to add a phrase that provides the option of imposing permit modifications with compliance schedules to achieve compliance.

§ 92.11. Duration of standards for certain new sources.

A commentator suggested the more stringent standard of performance be for the lesser of 10 years or during the depreciation period. This suggested change was not made because this regulation is based on Federal regulatory requirements.

Proposed rulemaking included a deletion of the phrase "standards of performance shall" and insertion of the phrase "requirements will" in lieu thereof. The final-form regulations reestablishes the original language based on comments opposing the new language as unclear.

§ 92.13. Reissuance or renewal of permits.

With respect to subsection (a), commentators expressed concern that the Department's Money-Back Guarantee time limits are inconsistent with the regulatory permit review limits. The Money-Back Guarantee does not influence the Department's ability to process permits in a shorter time frame. No changes were made to this section.

Some commentators suggested that recent case law would require incorporation of a broad compliance review for all permitting activities. The scope of the compliance evaluation in subsection (b)(1) was expanded in the final-form regulations to include all Department issued permits, regulations and orders. A reference to other appropriate regulations was included at the end of the subsection to allow consideration of compliance schedules outside of the requirements of Chapter 92.

§ 92.21. Applications.

Some commentators requested the reinsertion of the phrase "not less than" in the final-form regulations to eliminate a perception that the proposed language required submittal at exactly 180 days. The recommended phrase has been reinserted in the final rule to provide clarity. Other commentators expressed concern that the time limits in the regulation were inconsistent with Department's Money-Back Guarantee. No change was made because the Money-Back Guarantee does not impact the Department's ability to process applications in a shorter period of time.

Based on comments received, a new paragraph (5) is added in the final-form regulations which includes a requirement for documentation that the applicant is in compliance with all existing Department permits, regulations, orders and schedules of compliance, consistent with similar changes made in § 92.13 (relating to reissuance or renewal of permits). Commentators suggested requiring the newspaper publication in subsection (b)(3) only for major modifications of the facility. No change was made because The Clean Streams Law requires this.

Subsection (c)(2) was deleted in the final-form regulations to be consistent with the revisions made to § 92.2b (relating to pollution prevention).

Comments on subsection (c) stated that some of the required information for a new facility application is generally available only after the commencement of a discharge, not when an application for a facility is being prepared. Accordingly, the provisions of subsection (c)(3)--(5) were transferred to a new subsection (d) which states that the

Department may require an applicant for a modification, renewal or reissuance of a permit under § 92.13, or when required under 40 CFR Part 122 to provide this information. In addition, proposed subsection (c)(6) is renumbered as subsection (c)(2) and proposed subsections (d)--(f) are renumbered as subsections (e)--(g).

§ 92.21a. Additional application requirements for classes of discharges.

A commentator requested that the provisions related to the determination that aquatic communities are excluded be clarified. Subsection (e) has been modified in the final-form regulations to state that water quality data confirming a lack of improvement will be the measure of the exclusion of aquatic communities.

Subsection (d) is clarified to cross reference the requirements in Chapter 102 for stormwater dischargers associated with construction activities.

Subsection (e)(2)(iii) is revised by providing a cross reference to the definition of "TMDL" in § 96.1 to provide clarity.

Proposed language in subsection (f) relating to discharges with approved pretreatment programs was deleted in the final rule. Subsections (g) and (h) of the proposal were renumbered as subsections (f) and (g) respectively.

Commentators stated that the elimination of CSOs is impossible, that the time required is too extensive to make this requirement a prerequisite to a permit renewal, that identifying all points of influent is impossible, and that elimination should only be required where the discharge will not meet water quality based effluent limitations. Subsection (f) of the final-form regulations includes provisions to allow for submitting a long-term control plan to "minimize" or "eliminate" CSO discharges. These changes are consistent with Department's published CSO Strategy. Additional revisions delete proposed subsections (g)(3)(i)--(v) and, in lieu thereof, reference a Federal publication rather than listing its content in summary in the regulations. Subparagrah (vi) was renumbered (ii) and a requirement for an implementation schedule was added to the final-form regulations (third element of an approvable CSO program). The provisions relating to the identification of points of inflow into combined sewers is retained in the final-form regulations. This activity is a necessary part of compliance with the nine minimum controls related to the minimization or elimination of CSOs.

Editorial changes were made to subsection (h) (now (g)) in the final-form regulations.

§ 92.22. Application fees.

A new subsection (f) was added to provide an exemption from permit fees for certain CAFOs consistent with the Department's CAFO Strategy. Existing subsection (f) was renumbered as (g).

§ 92.25. Incomplete applications or notice of intent.

A minor editorial change to the proposal is made. The proposal references a notice of intent "to participate in" an NPDES general permit. The phrase "participate in" is replaced with "be covered by" since that is a more accurate description of the general permit process.

§ 92.31. Effluent limitations or standards.

An editorial change was made to subsection (a). Subsection (a)(9) was added to cross reference water quality protection requirements in Chapter 96 and subsection (a)(10) was added to cross reference antidegradation requirements.

§ 92.41. Monitoring.

A number of commentators objected to the addition of proposed subsection (b), asserting that the provisions allow arbitrary requirements and time limits to be set by the Department. The proposed subsection was proposed for deletion in the ANFR. After reconsideration, this language was rewritten to eliminate those portions of the provision on which objections were received. References to requests for additional information by the Department, which were perceived as arbitrary were deleted, and provisions retained which establish monitoring and reporting requirements to be incorporated in permit documents. The last two sentences of proposed subsection (b) (relating to monitoring pollutants not limited in the permit) are deleted in the final-form regulations. Commentators asserted that these provisions were overly broad, inconsistent with Federal requirements or not in the spirit of the RBI.

The amendments to subsections (c) and (g) make it clear that the monitoring requirements of subsection (g) also apply to stormwater discharges associated with construction activities and that subsection (c) is not applicable to stormwater discharges associated with industrial activity. No comments were received on this change. The proposed change is retained in the final-form regulations.

§ 92.51. Standard conditions in permits.

Some commentators suggested that the language in proposed paragraph (6) was confusing and should be simplified to say that compliance with all water quality standards is required. The proposed subsection was clarified in the ANFR by breaking it up into two sentences. Additional comments were received asserting that the changes made the provisions less clear. The final-form regulations incorporate the provisions into a single sentence and retains language that is consistent with the intent of the original regulation. A new paragraph (7) was added to the final-form regulations in response to comments to clearly state that dischargers must comply with applicable water quality standards.

§ 92.52a. Site specific permit conditions.

The final-form regulations delete the last sentence proposing pollution prevention measures. This change is consistent with the position described in response to comments made on § 92.2b. Commentators stated that the proposed provisions were too broad and that BMPs should be established through the regulatory process. The final-form regulations includes a provision that requires permittees to identify BMPs reasonably necessary to achieve effluent limitations and standards or to carry out the purpose and intent of the Federal Act (the Clean Water Act) and to implement toxic reduction activities, effluent limitations based on WETT and other measures which eliminate or substantially reduce pollutants at their source. These final-form regulations provide the permittee with the opportunity to take an active role in establishing sufficient BMPs to achieve protection of surface waters.

§ 92.61. Public notice of permit application and public hearing.

WRAC recommended that the Department seek public comment on the need for an additional public notice when an NPDES application is renewed or when an applicant intends to apply for an NPDES permit, before an application is completed. Comments on this issue ranged from support for the notice of intent to support for no additional public notice. The Department believes the existing requirements for public notice are sufficient and no change has been made in the final-form regulations.

A new subsection (a)(9) was added to cross reference regulations promulgated at 29 Pa.B. 3720 (July 17, 1999) which provide that the notice shall include the antidegradation classification of the receiving surface water.

§ 92.71a. Transfer of permit.

Based on comments received regarding the need to include compliance evaluations as a part of permit actions, a new paragraph (4) has been added to the final-form regulations that requires compliance with all Department permits prior to approval of permit transfers.

§ 92.72a. Cessation of discharge.

Commentators stated that the 180-day notice should be reduced to 90 days to be consistent with State mandated notification requirements. The final-form regulations establishes the 90-day notification requirement.

§ 92.73. Prohibition of certain discharges.

This section is revised to provide that a permit will not be issued, modified, renewed or reissued under any of the conditions enumerated.

Paragraph (8) of the proposal provided that a permit will not be issued to a "discharger with a sanitary sewer overflow unless the discharger can demonstrate that it is taking measures to eliminate any overflows as soon as practicable, including, but not limited to a complete evaluation of the sanitary sewer system, the reduction of infiltration and inflow into the sanitary sewer system, the elimination of illegal hookups to the system, the institution of a ban or prohibition on sewer hookups to the sanitary sewer, and any other measures which will eliminate the overflows." The quoted portion of this subsection was deleted in the final rule because it is inconsistent with applicable State and Federal policy. The final-form regulations states that a permit will not be issued for a sanitary sewer overflow, except as provided for in the Federal regulations.

§ 92.81. General NPDES permits.

A large number of commentators objected to the proposed revisions to subsection (a)(5) because of a perception that this provision would allow discharge of toxic substances under a general permit. While the Department had no such intent when these amendments were drafted, the existing language prohibiting issuance of an NPDES general permit for the discharges has been reinstated in the final-form regulations.

Subsection (a)(8) of the proposal would have authorized issuance of a general permit for

discharges to High Quality Waters, but not to Exceptional Value Waters. A large number of commentators objected to this provision at proposed rulemaking. Accordingly, as part of the ANFR it was proposed to reinstate existing language that prohibits the issuance of general NPDES permits for activities in High Quality Waters. In response to the ANFR, the Department received a very large number of comments on both sides of this issue. The final-form regulations retain the reinstated (or existing) language prohibiting the issuance of general permits in High Quality Waters. This provision supports the Department's overriding State interest in the protection of High Quality Waters and in the provision of a broad opportunity for public comment when permit applications are received for facilities proposed in these watersheds. In addition, a recently developed individual NPDES permit for existing CAFOs in High Quality Waters clearly demonstrates the ability to create a simplified permit application process under the individual NPDES regulations while protecting the environment. A conforming change was made in § 92.83(b)(9) (relating to denial of coverage under a general NPDES permit).

The Board received comments objecting to the proposed deletion of a provision that general NPDES permits are to comply with of §§ 92.59 and 92.83(a)(1) (relating to documentation of permit conditions; and inclusion of individual discharges in general NPDES permits) that dischargers "certify" rather than "demonstrate" that the discharge will not result in a violation of an applicable water quality standard. Accordingly, the reference to § 92.59 was reinstated in § 92.81(b) and the existing term "demonstrate" reinserted in lieu of "certify" in § 92.83(a)(1) in the final-form regulations.

Some commentators opposed the proposed revisions to subsections (c) and (d) because they believed some of the options eliminated the opportunity for public comment. Two subsections proposed the inclusion of language from the Federal regulations that would have allowed discharges to commence: (1) on a date specified in the general permit; and (2) upon receipt of the notice of intent by the Department. These proposals have been deleted in the final-form regulations because they create circumstances that would make it impossible for the Department to keep a record of these discharges and they would have provided no opportunity for public comment. In addition, the proposal provided that a discharge under a general NPDES permit would be authorized after a waiting period specified in the general permit. This provision is retained, but clarifying language is added stating that the discharge may only commence following receipt of a Notice of Intent (NOI) by the Department. In addition, the provision authorizing the commencement of discharges "upon receipt of the notification of inclusion by the Department" is revised in the final rule to provide that the discharge may commence upon receipt of notification of approval of coverage under the general NPDES permit from the Department. Subsection (d) of the proposal relating to when an NOI would not be required was deleted in the final-form regulations for the same reasons outlined. Proposed subsection (e) was renumbered as subsection (d).

Commentators questioned the need for proposed subsection (e). This section was modified as subsection (d) in the final-from regulations to provide that the Department "will" notify a discharger that it is "or is not" covered under a general NPDES permit. In addition, the clause, "even if the discharger has not submitted a notice of intent to be covered" was deleted.

§ 92.83. Inclusion of individual dischargers in general NPDES permits.

Subsection (a)(3)(iii) has been deleted because it would have, consistent with the approach allowed under the Federal regulations, authorized the Department to provide no

public notice of applications for general permits or approvals of coverage. This provision was not carried forward in the final-form regulations because it did not allow for sufficient public notice. Subsection (a)(1) was amended to clarify applicable requirements for NOIs.

A number of commentators commented that the EHB recently issued a ruling stating that compliance history review is not limited to prior NPDES permits, but to all permits issued by the Department. A commentator also asserted that the list of items to be considered was inconsistent with The Clean Streams Law. Accordingly, subsection (b) was revised to include violations of Department-issued permit as grounds for denial of the general permit coverage and to reference the entire list of items to be considered under The Clean Streams Law. The remainder of the subsection was renumbered.

§ 92.92. Method of seeking civil penalty.

A commentator objected to the regulation on the basis that it removes a right to a prehearing for alleged violations. A discussion of the due process protections provided by the procedures established in the regulation is provided in the comment and response document.

§ 92.93. Procedure for civil penalty assessments.

There were several comments requesting clarifying language regarding delivery of notices, the specifics of the hearing procedure, the scheduling of hearings, posting notice, and provision of notice from the Department concerning EHB rules of practice. A change was made in the final rule to subsection (c) regarding the posting of notice. An explanation is provided in the comment and response document regarding the remaining comments.

Also in subsection (c), a clause is added clarifying that a person requesting a hearing has a right to be represented by counsel, and a change is made providing that the Department need not make a decision at the hearing.

§ 92.94. Disbursement of funds pending resolution of appeal.

Subsection (a) of the final-form regulations has been modified to replace the word "law" with "section 605 of The Clean Streams Law (35 P. S. § 691.605)."

A commentator stated that preclusion of permit issuance should only be imposed on a specific facility when a company has more than one facility in this Commonwealth. This provision is not mandatory and would be imposed only when there is a continued pattern of failure to pay final assessments. No change was made in the final-form regulations.

Chapter 93. Water Quality Standards

Section 93.4. Statewide water uses.

WWF (warm water fishes) has been reinserted in Table 2 as the default aquatic life protection because several comments made the point that there would be no default aquatic life protection of waters inadvertently not listed in the chapter.

Many comments addressed the question of retaining the Statewide potable water supply

use, some offering distinct reasons why it should be eliminated, but many others expressing support for keeping it. The use is retained without change.

A few comments suggested that the aesthetic water quality criteria for manganese and dissolved iron be applied at the point of potable water intake, as are other aesthetic criteria, under § 96.3 (relating to general water quality). The Department will analyze the impacts/benefits of this issue as part of its next triennial review of water quality standards.

A few comments were directed toward the Department adopting amended wildlife protection and protection of hydrologic regimes and habitat. At this time, there is no National guidance to assist the Department in moving forward with changes to wildlife protection. The Department is working with the Fish and Boat Commission on new habitat and stream flow criteria development, but it is premature to make changes at this time. These issues are all likely to be considered in future water quality standards reviews.

Section 93.7. Specific water quality criteria.

Comments concerning Table 3 included the following:

Alkalinity--The site-specific exception to the alkalinity criterion was reinserted because it was noted that many of this Commonwealth's streams may naturally violate the criterion, and without the exception, there would have to be regulation changes made for a very large number of site-specific criteria to amend the listings in §§ 93.9a--93.9z if the language were removed.

Aluminum--In the proposal, the aluminum criterion was amended and moved to Table 1, Chapter 16--Water Quality Toxics Management Strategy--Statement of Policy, where other water quality criteria for toxics are listed. The EPA and others commented that there was not adequate justification for the Commonwealth to not also adopt the chronic criterion. The Department believes that the chronic criterion of 87 μg/l should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies. The chronic studies described in the EPA's 1988 Ambient Water Quality Criteria for Aluminum document do not show a consistent pattern of toxicological response to the different exposure concentrations within or between the various tests described. The final chronic value developed following the EPA's procedures and based on available acute-chronic ratios is 750 μg/l, the same value as the acute criterion. However, the EPA then lowered the final chronic value to 87 μg/l, claiming it to be necessary to protect brook trout and striped bass. The EPA's justification for this adjustment was data derived from studies that the EPA later described as data that should not be used in the criteria development. The EPA staff have agreed that the aluminum toxicity is very complex due, in part, to the complexity of its chemistry and interactions with local water quality conditions and biological community. The EPA also agrees that the studies that were used in driving the derivation of the chronic criterion are limited in their application and should receive additional review. The Department cannot adopt the flawed chronic criterion for use in this Commonwealth without better justification. As recently as December 1999, the EPA reiterated that aluminum criteria issues are not a priority for the agency. Therefore, the Department believes that aluminum toxicity to fish and aquatic life will be adequately managed using the acute criterion of 750 μg/l. The Department will also continue to monitor the scientific literature and the EPA's evaluations of aluminum toxicity and amend the criterion or add a chronic criterion, if indicated. The criterion is unchanged from the proposal.

Ammonia--The ammonia criteria is not changed to match the new the EPA criteria finalized in December 1999, but will be considered in the next Triennial Review.

Bacteria--In response to an EPA comment, language is added to Bac1 which limits to no more than 10% the samples that may exceed 400 fecal coliform per 100 ml in a 30-day period for the criteria to be attained.

DO (dissolved oxygen)--The language for DO_3 (for trout stocking fishes (TSF)) is clarified to state that the criteria for lakes, ponds and impoundments apply to the epilimnion in response to a comment.

Phenolics--To respond to comments expressing concern for protecting water supplies, the Statewide criterion for phenolics (Phen - 0.005 mg/l) is retained. This criterion is applied under new § 96.3(d).

Temperature--Language inadvertently struck from the new listing of temperature criteria in the proposal was reinserted to assure protection of aquatic life. The language states that in addition to the temperature criteria, wastes may not cause more than a 2°F rise in temperature in any 1-hour period.

Subsection (e), which was proposed to be deleted, is reinserted as (b) and the accompanying table is renamed Table 4 in response to comments that pointed out that the Table provides a ready reference to the criteria applicable to aquatic life uses, including High Quality and Exceptional Value Waters. The table has been modified to acknowledge the removal of the list of Statewide criteria (former Table 4) and the numbering change to DO criteria.

Accordingly, numbering changes are made to the remaining subsections. Subsection (c) is amended to the original language that provides that additional criteria will (not may as proposed) be developed using best scientific information. New subsection (d) is clarified to state that when the Department determines that the natural quality of a surface water is lower than the applicable aquatic life water quality criterion, the natural quality will become the aquatic life criterion for that segment following public notice and comment.

Section 93.9. Designated water uses and water quality criteria.

Section 93.9e (relating to Drainage List E) is modified to correct the turbidity criteria symbols from Tur 3 and 4 to Tur 1 and 2. The change is not substantive.

In § 93.9o (relating to Drainage List O), several comments on the proposal and ANFR addressed the issue of the color criterion for the Codorus Creek in York County. Some comments gave lengthy reasons why 50 pcu was the appropriate criterion and should remain in place, and others questioned the scientific basis for that criterion, stating the Statewide criterion should apply. Following consideration of all the comments, the site-specific color criterion for the Main Stem, Codorus Creek in York County is removed and the Statewide color criterion (75 platinum cobalt units) will apply to the stream. When it is achieved, the criterion will enhance water quality in the stream.

In § 93.9p (relating to Drainage List P), an error for Tunungwant Creek in McKean County, which deleted the water contact sport use (WC) for the main stem from the

confluence of the East and West Branches to the PA-NY State border, has been corrected. The Department conducted a use attainability study in 1985 which supported the correction and the water contact sports use was added as a designated use at the November 15, 1988, Board meeting, and published at 17 Pa.B. 968 (March 11, 1989). This regulatory revision was not, however, incorporated into the *Pennsylvania Code* until now.

Chapter 95. Wastewater Treatment Requirements

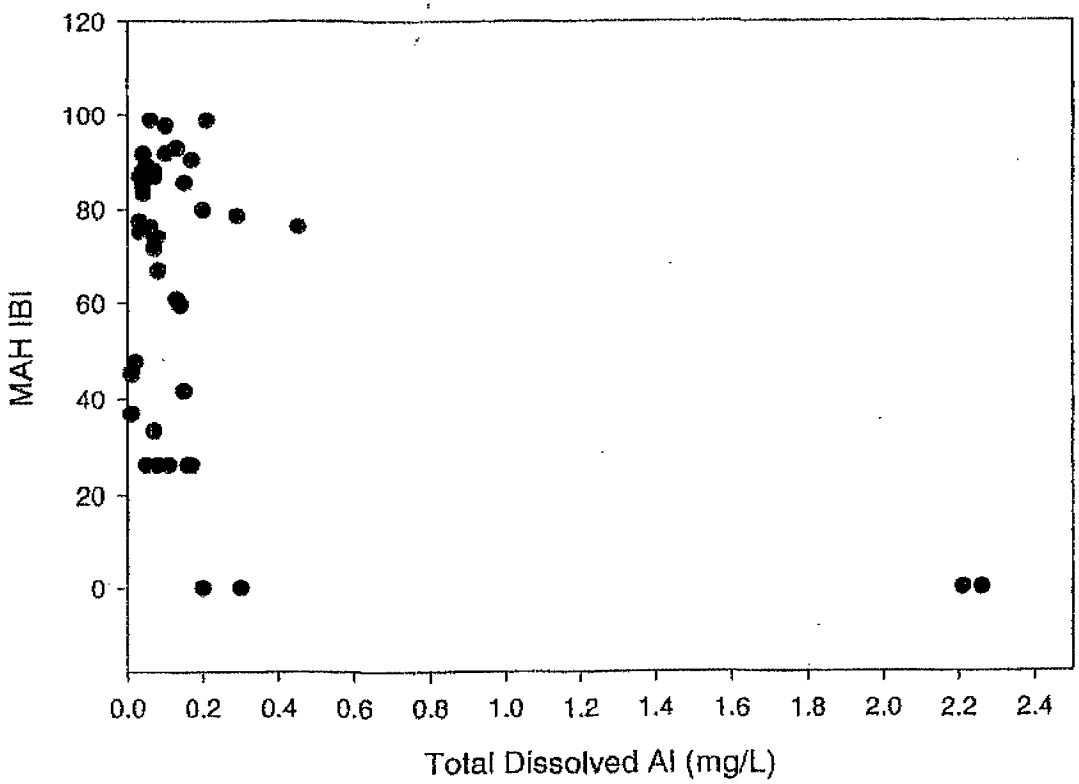
Section 95.1 (relating to special protections), which has recently been amended at 29 Pa.B. 3720 (July 17, 1999) is deleted as unnecessary in light of the inclusion of the language in § 92.2a(a).

Commentators objected to the incorporation of provisions in § 97.15 into § 95.2 of the final-from regulations. These provisions incorporate quality standards for industrial wastes including the prohibition of discharges that are acid, a pH requirement and an iron limit of no more than 7 milligrams per liter of dissolved iron. These provisions were retained in the final-form regulations as necessary to protect water quality from pollutants not regulated as point sources under the NPDES regulations.

Commentators objected to the elimination of §§ 95.4 and 95.5 from proposed rulemaking. This error occurred at the Legislative Reference Bureau, and was corrected at 28 Pa.B. 577 (November 7, 1998).

[Continued on next Web Page]

ATTACHMENT D



MAH IBI is a fish based index of biotic integrity for the Mid-Atlantic Highlands region.

Data are from 48 streams scattered throughout the Cheat River watershed.

Relationship between Al and fish is poor primarily because there are many bad streams with almost no Al in them. These streams received mine effluent, but pH is high enough for the Al to precipitate. A good reason why field based relationships should not be used to set water quality criteria. Also evidence that water quality criteria alone do not ensure ecological integrity.

ATTACHMENT E

All Wapbase samples with Dissolved Al > 0.087 (n=1454)

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVMC-60-D-2.5	0.2	Lindy Run	5/15/01	0.47	0.49	3.91		0.4		0.18		1	Cheat	71.33
WVKG-34-H-11.5	0	Carpenter Run	9/23/03	0.45	0.44	3.91		0.53			<	3	Gauley	
WVKG-34-H-11.5	0	Carpenter Run	9/9/03	0.399	0.394	4.31		0.56			<	3	Gauley	
WVMC-60-F-3	1.2	Moore Run/Otter Creek	5/15/01	0.3	0.4	4.04		0.57		0.27		1	Cheat	66.69
WVKG-34-H-8	0	Windy Run	9/23/03	0.32	0.33	4.19		0.58				3	Gauley	
WVMC-60-D-7	0.2	Yellow Creek	6/12/01	0.21	0.34	3.51		0.59		0.29		1	Cheat	58.35
WVKG-34-H-9	0	Armstrong Run	9/23/03	0.32	0.33	4.12		0.67			<	3	Gauley	
WVKG-34-H-11.5	0	Carpenter Run	1/13/04	0.48	0.46	4.34		0.7			<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	9/9/03	0.32	0.38	4.43		0.7			<	3	Gauley	
WVMC-60-O-5	0.6	Little Stonecoal Run	6/3/03	0.28	0.29	4.15		0.7		0.4	<	3	Cheat	79.67
WVKG-34-H-11.5	0	Carpenter Run	3/4/04	0.65	0.72	3.42		0.71				4	Gauley	
WVKG-34-H-11.5	0	Carpenter Run	11/18/03	0.42	0.44	4.00		0.73			<	3	Gauley	
WVKG-34-H-8	0	Windy Run	3/4/04	0.52	0.58	3.84		0.73			<	3	Gauley	
WVKG-34-H-8	0	Windy Run	11/18/03	0.34	0.36	4.30		0.75			<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	11/18/03	0.39	0.39	4.30		0.8			<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	1/31/04	0.4	0.4	4.82		0.8			<	3	Gauley	
WVMCS-35		Fall Run	5/9/01	0.31	0.32	3.92		0.8	<	0.5	<	5	Cheat	62.37
WVMC-60-F-7		Yellow Creek/Otter Creek	4/30/01	0.39	0.64	4.12		0.82		0.36		2	Cheat	67.47
WVKG-34-H-9	0	Armstrong Run	12/15/03	0.39	0.39	4.20		0.84			<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	3/4/04	0.52	0.57	3.72		0.86			<	3	Gauley	
WVPC-7-L	0.1	Meadow Run	6/21/00	0.13	0.25	4.86		0.87		0.61		18	Cacapon	64.2
WVKG-34-H-8	0	Windy Run	4/7/04	0.38	0.42	4.76		0.88			<	3	Gauley	
WVMCS-36		Red Run	5/9/01	0.24	0.3	4.17		0.9		0.5	<	5	Cheat	70.83
WVKG-34-H-8	0	Windy Run	1/13/04	0.34	0.34	4.81		0.97			<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	4/7/04	0.39	0.42	4.75		0.97			<	3	Gauley	
WVMC-60-D-5-H	0	UNT/Beaver Creek RM 11.0	6/11/02	0.14	0.2	4.83		1.06		0.5	<	3	Cheat	60.14
WVMT-42-E	0.6	UNT/Roaring Creek RM 11.0	6/11/02	0.19	0.23	4.68		1.09		0.5	<	3	Tygart Valley	73.37
WVMC-60-O	7.5	Red Creek/Dry Fork	6/5/01	0.24	0.36	3.79		1.43		0.41		1	Cheat	54.53
WVMTB-32-I-1		Phillips Camp Run	9/15/97	0.132	0.098	5.10		1.6		0.5	<	5	Tygart Valley	79.63
WVMC-18-A	0.2	Lick Run/Roaring Creek	5/22/01	0.64	0.78	4.35		1.61		0.76		1	Cheat	66.36
WVMC-60-O-4		South Fork/Red Creek	6/5/01	0.36	0.51	3.63		1.68		0.51	<	1	Cheat	80.53
WVMC-17	10.2	Muddy Creek	6/26/01	0.097	0.234		<	1.763		1.75	<	3.143	Cheat	83.26
WVPSB-1.9	0.2	UNT/South Branch Potomac RM	6/26/01	0.098	0.203	7.44	<	1.763		9.14		11	South Branch	58.11
WVMC-60-F-8		Condon Run	4/30/01	0.33	0.74	4.46		2.18		0.64		2	Cheat	75.58
WVMT	98.9	Tygart Valley River	10/14/02	0.11	0.35	7.41		2.26		14		5	Tygart Valley	
WVMT-64	12.7	Mill Creek	5/20/03	0.0954	0.123	7.19		2.39	<	0.1		1	Tygart Valley	81.44
WVMC-12-A-1	2.2	Little Laurel Run	5/23/01	0.2	0.34	4.66		2.44		1.31		2	Cheat	70.31
WVMC-17-B	0	Jump Rock Run	5/16/01	0.38	0.54	5.09		2.48		0.69		1	Cheat	73.19
WVMCS-50		First Fork/Shavers Fork	4/2/01	0.1	0.14	7.09		2.6		0.62	<	5	Cheat	81.71
WVMC-6-A-2	0	UNT/Clay Run RM 1.0	5/22/01	0.11	0.16	5.40		2.83		1.5		2	Cheat	74.12

ANC066	Mile Point	Stream Name	Date	Dis Al /L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKGC-23	1	South Fork/Cranberry River	5/28/03	0.11	0.33	6.68		3.1		0.7		6	Gauley	81.31
WVMC-12-B-5-C	0.9	UNT/Cherry Run	5/8/01	0.11	0.29	4.66		3.11		1.46		2	Cheat	68.21
WVPSB-28-EE	4	Big Run/North Fork	7/11/01	0.12	0.23	7.14		3.34		0.82	<	5	South Branch	90.04
WVPSB-21-E	1.3	Stump Run/South Fork/South	6/21/01	0.15	0.32	6.44		3.4		2.3	<	5	South Branch	82.9
WVMC-6-A	1.8	Clay Run	5/21/01	0.09	0.18	5.29		3.44		1.73		1	Cheat	81.65
WVPSB-21-E	1.3	Stump Run/South Fork/South	6/21/01	0.17	0.32			3.5		2.4	<	5	South Branch	92.24
WVMC-60-D-3-C	1.2	Snyder Run	6/11/01	0.18	0.42	6.36		4		0.72		2	Cheat	61.19
WVMT	75.9	Tygart Valley River	10/14/02	0.13	0.38	7.51		4.31		16.7		8	Tygart Valley	
WVKGC	15.2	Cranberry River	5/28/03	0.11	0.16	6.96		4.4		0.6	<	3	Gauley	92.6
WVM-8-B.2	0.7	UNT/Deckers Creek RM 8.8	7/9/03	0.16	0.77	5.82		4.63		0.93		6	Monongahela	65.4
WVOG-137-C	0.7	Wiley Spring Branch	9/11/00	0.24	0.28	7.23		4.65		2.32		1	Upper	80.73
WVMT	65.1	Tygart Valley River	10/14/02	0.18	0.41	7.65		4.74		18.6		5	Tygart Valley	
WVMT-41	1	Grassy Run	9/15/97	14.246	0.05	3.10		5.9		1.5	<	5	Tygart Valley	
WVMC-60-D-3-C	0	Snyder Run	6/6/01	0.13	0.306	7.56		6.1		1.3		5	Cheat	90.71
WVKE-6	5.6	Mill Creek	7/3/97	0.16	0.55	6.90		6.6		2.5		6	Elk	69.09
WVOG-137-B	0.5	Bluff Fork/Devils Creek	9/11/00	0.26	0.29	7.10		7.2		5.26		2	Upper	73.76
WVMW-13-I-2		Cherrycamp Run	3/21/01	0.133	5.74	7.24		7.5		2.78		145	West Fork	
WVMTB-7-C	0.32	UNT/Sand Run	9/4/97	0.089	0.14	7.60		7.7		1.9		6	Tygart Valley	78.87
WVOGC-16-J-1	0.6	Tom Bailey Branch	8/29/00	0.13	0.22	7.68		7.82		3.13		3	Upper	54.63
WVMW-13-I-3		Patterson Fork	3/21/01	0.129	6.07	7.19		7.92		2.82		121	West Fork	
WVOG-134-E		Old Slab Fork	8/30/00	0.13	0.2	7.50		8.1		2.82		5	Upper	75.97
WVMW-13-F-1		Little Rockcamp Run	3/21/01	0.095	6.49	7.38		8.83		2.99		137.6	West Fork	
WVMW-13-F	0.1	Rockcamp Run	3/21/01	0.089	10.2	7.39		8.94		3.52		238	West Fork	
WVMC	41.4	Cheat River	6/18/01	0.13	0.33	7.35		9.08		1.51		2	Cheat	
WVMW-36-D	0	Right Fork/Freeman Creek	3/21/01	0.121	2.86	7.14		9.45		2.51		364	West Fork	
WVMC-12-C-5	0.2	5th UNT/Hazel Run	5/15/01	0.09	0.12	7.43		9.57		1.91		1	Cheat	72.12
WVMC	72.6	Cheat River	6/18/01	0.16	0.22	7.40		9.83		1.55		1	Cheat	
WVKE	107	Elk River	7/8/02	0.19	0.2	7.79		10.6		3.32	<	3	Elk	
WVKE	89.5	Elk River	11/4/02	0.15	0.18	7.32		11		2.88	<	3	Elk	
WVMC	32.9	Cheat River	6/18/01	0.09	0.68	7.27		11.1		2.24		2	Cheat	
WVKE	89.5	Elk River	7/8/02	0.21	0.26	7.75		11.2		3.5	<	3	Elk	
WVKE	56.3	Elk River	11/6/02	0.25	0.53	7.33		11.5		0.2		8	Elk	
WVKN-22-K	5.3	Mill Creek	4/22/02	0.28	0.44	4.29		11.5		7.11		8.8	Lower New	57.58
WVKE	56.3	Elk River	8/6/02	0.16	0.16	7.79		11.6		4.12	<	3	Elk	
WVKE	107	Elk River	11/4/02	0.16	0.18	7.27		12.3		3.2	<	3	Elk	
WVKE	107	Elk River	9/3/02	0.14	0.22	7.42		12.3		3.58	<	3	Elk	
WVKE	107	Elk River	8/5/02	0.14	0.17	7.62		12.4		3.51	<	3	Elk	
WVKE	56.3	Elk River	10/8/02	0.13	0.15	7.83		12.4		3.97	<	3	Elk	
WVKE	89.5	Elk River	9/3/02	0.17	0.22	7.73		12.5		3.78	<	3	Elk	
WVOG-134	7.8	Slab Fork	9/6/00	0.095	0.414	7.24		12.6		6.74		25	Upper	67.01
WVKE	27.2	Elk River	11/6/02	0.24	0.43	7.18		12.8		0.28		3	Elk	
WVMC	20.9	Cheat River	6/18/01	0.12	0.5	7.44		13		2.61		3	Cheat	
WVMTM	2.8	Middle Fork River	7/23/02	0.12	0.15	7.74		13		1.46	<	3	Tygart Valley	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKE	27.2	Elk River	8/6/02	0.16	0.24	7.57		13.2		5.8	<	3	Elk	
WVMTM	2.8	Middle Fork River	8/12/02	0.17	0.33	7.90		13.2		2.56	<	3	Tygart Valley	
WVOGC-16-C	0.1	Cabin Branch/Laurel Fork	8/29/00	0.12	0.22	7.62		13.5		5.52		5	Upper	48.15
WVMTB-18	11.2	French Creek	9/3/97	0.147	0.15	7.40		14		2.8		10	Tygart Valley	60.07
WVO-2-Q-8-A	2.8	Left Fork/Camp Creek	4/24/02	0.09	0.26	7.37		14.1		3.69	<	3	Twelvepole	78.12
WVMW-13-N		Coburn Fork	3/21/01	0.177	16	7.48		15.1		5.2		492	West Fork	
WVKE	56.3	Elk River	9/4/02	0.21	0.24	7.91		15.5		4.53	<	3	Elk	
WVMT	98.9	Tygart Valley River	9/6/02	0.17	0.2	7.56		15.5		2.4	<	3	Tygart Valley	
WVMC-60-D	0.8	Blackwater River	6/13/01	0.43	1.48	7.52		15.6		3.4	<	5	Cheat	67.5
WVKE	27.2	Elk River	9/4/02	0.2	0.28	7.48		15.7		6.62	<	3	Elk	
WVKE-76	11.9	Birch River	11/4/02	0.12	0.24	7.48		16.2		8	<	3	Elk	
WVMT	98.9	Tygart Valley River	7/24/02	0.25	0.33	7.50		16.7		2.17		3	Tygart Valley	
WVMT	6.5	Tygart Valley River	8/12/02	0.25	0.26	8.28		17		3.74	<	3	Tygart Valley	
WVKE	4.4	Elk River	9/4/02	0.14	0.18	7.53		17.1		7.2	<	3	Elk	
WVMW-13-N-1		Shaw Run	3/21/01	0.143	52.3	7.45		17.1		10.3		1732	West Fork	
WVMC-60-D	8.2	Blackwater River	6/12/02	0.13	0.27	7.67		17.4		2.5	<	3	Cheat	75.4
WVMT	6.5	Tygart Valley River	9/5/02	0.25	0.25	7.68		17.4		3.42	<	3	Tygart Valley	
WVKE-23	0.9	Big Sandy Creek	11/6/02	0.14	1.77	7.35		17.8		0.31		40	Elk	
WVOG-134	0.3	Slab Fork	9/5/00	0.165	0.868	7.56		17.9		8.23		12	Upper	60.19
WVO-2	9.6	Twelvepole Creek	4/17/00	0.12	2.2	7.05		18		5		50	Twelvepole	
WVMT	98.9	Tygart Valley River	8/13/02	0.18	0.11	7.58		18.3		2.86	<	3	Tygart Valley	
WVMT	75.9	Tygart Valley River	7/24/02	0.13	0.23	7.68		18.3		2.6	<	3	Tygart Valley	
WVKC-31-B.4	0.8	UNT/Laurel Fork RM 3.6	4/24/03	1.88	1.88	4.34		18.6		27.2	<	3	Coal	70.87
WVMT	6.5	Tygart Valley River	7/23/02	0.13	0.16	8.02		18.9		3.38	<	3	Tygart Valley	
WVKE	4.4	Elk River	10/9/02	0.14	0.21	7.55		19.2		7.13	<	3	Elk	
WVOG-131	5.2	Barkers Creek	9/6/00	0.16	0.19	7.75		19.35		7.29		3	Upper	55.58
WVMTM	2.8	Middle Fork River	9/5/02	0.21	0.26	7.87		19.7		3.78	<	3	Tygart Valley	
WVK-49-B	1.6	Spring Fork	7/19/01	0.13	0.72	7.26		20.9		10.5		22	Upper Kanawha	
WVMC	35.6	Cheat River	5/1/01	4.76	5.67	3.24		21		5.3	<	1	Cheat	
WVK	1.5	Kanawha River	10/23/02	0.14	0.28	7.43		21.1		7.75	<	3	Lower Kanawha	
WVKC-10-U-7	4.3	West Fork	9/18/97	0.3	0.38	8.50		22		12	<	5	Coal	50.98
WVK	44	Kanawha River	10/23/02	0.15	0.24	7.55		22.3		6.29		8	Lower Kanawha	
WVMT	65.1	Tygart Valley River	7/24/02	0.19	0.32	7.71		22.3		5.18	<	3	Tygart Valley	
WVKC-10-U-7	2.3	West Fork	4/30/03	0.17	0.22	8.53		22.5		13.9	<	3	Coal	66.26
WVKE-23	0.9	Big Sandy Creek	7/9/02	0.17	0.18	7.59		22.7		5.52	<	3	Elk	
WVMC-60-D-3-A		Long Run/North Fork/Blackwater	6/12/01	6.91	8.37	3.14		22.7		5.62		2	Cheat	27.86
WVMT	47.7	Tygart Valley River	7/23/02	0.19	0.21	7.63		23.2		2.82	<	3	Tygart Valley	
WVMT	75.9	Tygart Valley River	8/13/02	0.25	1.09	6.88		23.3		4.79	<	3	Tygart Valley	
WVMT	47.7	Tygart Valley River	8/12/02	0.28	0.3	7.51		23.7		4.31	<	3	Tygart Valley	
WVKE-26-A	0.16	Left Fork/Morris Creek	7/9/97	8.26	7.3	3.50		24		12	<	5	Elk	
WVKP	5.2	Pocatalico River	8/7/02	0.14	0.22	7.69		24.2		4.94		14	Lower Kanawha	
WVKE-23	0.9	Big Sandy Creek	8/6/02	0.25	0.31	7.51		24.8		5.67		4	Elk	
WVOG	126	Guyandotte River	8/28/00	0.1	0.11	6.84		24.9		10.98		6	Upper	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVO-2-Q-8-A		Left Fork/Camp Creek	5/3/00	2.7	5.9	4.80		25		11			Twelvepole	81.3
WVMT	65.1	Tygart Valley River	8/13/02	0.3	0.38	7.67		25.2		5.44	<	3	Tygart Valley	
WVKP	45	Pocatalico River	8/21/02	0.15	0.88	6.97		25.5		4.9		30	Lower Kanawha	68.95
WVOG-131	0.6	Barkers Creek	9/6/00	0.12	0.15	7.89		25.8		8.97		4	Upper	56.33
WVMW-23	4.1	Browns Creek	3/21/01	0.093	2.86	7.66		26.4		5.81		43	West Fork	
WVKE-23	0.9	Big Sandy Creek	9/4/02	0.23	0.27	7.41		26.9		6.96		5	Elk	
WVM-1	21.4	Dunkard Creek	6/6/00	0.09	3.86	7.72		26.9		6.14		96	Dunkard	
WVMT-42	7.7	Roaring Creek	9/16/97	1.866	1.8			27		13	<	3	Tygart Valley	50.18
WVM-1-A	3.5	Dolls Run	5/30/00	0.1	0.11	7.72		27.4		6.54		20	Dunkard	77.65
WVMT	75.9	Tygart Valley River	9/6/02	0.28	1.99	6.44		27.8		6.11		5	Tygart Valley	
WVOG	142	Guyandotte River	9/7/00	0.13	0.26	8.14		27.9		12.1		4	Upper	
WVKE-50	0.7	Buffalo Creek	11/6/02	0.2	0.35	7.30		28.2		1.25		6	Elk	
WVMT	65.1	Tygart Valley River	9/6/02	0.3	0.33	7.54		28.2		6.08	<	3	Tygart Valley	
WVOG	120	Guyandotte River	9/6/00	0.2	0.25	8.38		28.2		13.5		5	Upper	
WVMTB	0.7	Buckhannon River	8/12/02	0.13	0.14	7.76		28.6		3.91	<	3	Tygart Valley	
WVMT	47.7	Tygart Valley River	9/5/02	0.3	0.32	7.74		28.8		5.55	<	3	Tygart Valley	
WVKN-22-G	3.36	White Oak Creek	4/1/02	2.45	3.15	5.05		29.9				13.2	Lower New	
WVMW-31-B		West Run/Hackers Creek	3/19/01	0.108	0.347	7.67		30		6.42		12.5	West Fork	
WVO-2-Q-8		Camp Creek	5/3/00	0.83	3.8	4.98		30		11			Twelvepole	63.93
WVOG	138	Guyandotte River	9/7/00	0.1	0.26	8.14		30.15		12.04		3	Upper	
WVK-73	2.7	Armstrong Creek	5/2/03	0.09	0.36	7.74		32		20.9	<	3	Upper Kanawha	69.08
WVMC-17	3.36	Muddy Creek	6/18/01	1.19	2.6	4.62		32		11.6		14	Cheat	76.6
WVOG-138-E		Mullens Branch/Winding Gulf	9/11/00	0.93	1.2	8.21		32		17		10	Upper	53.18
WVMTB	0.7	Buckhannon River	7/23/02	0.15	0.23	8.23		32.2		3.13	<	3	Tygart Valley	
WVKE-76	11.9	Birch River	7/8/02	0.25	0.29	7.88		33		11.5	<	3	Elk	
WVKE-50	0.7	Buffalo Creek	8/6/02	0.17	0.32	7.60		33.4		19.4	<	3	Elk	
WVKE-76	11.9	Birch River	8/5/02	0.15	0.22	8.14		33.4		15.1	<	3	Elk	
WVOG-131-C		Mill Branch/Barkers Creek	9/6/00	0.17	0.34	7.56		33.9		14.92		5	Upper	54.16
WVOG-138	0.7	Winding Gulf	9/6/00	0.175	0.354	8.12		34.2		16.6		16	Upper	62.14
WVOG-131-F		Gooney Otter Creek	9/5/00	0.19	0.38	8.13		34.8		11.46		3	Upper	64.93
WVOG-131-B		Hickory Branch/Barkers Creek	9/6/00	0.15	0.23	7.61		35.7		17.14		7	Upper	68.8
WVMT-18-E	0.4	Little Sandy Creek	9/4/97	10.06	10	3.53		36		9.5	<	5	Tygart Valley	45.23
WVMT-37	2.8	Beaver Creek	9/15/97	0.318	0.44	5.10		36		11		8	Tygart Valley	67.76
WVBST-24	13.5	Pigeon Creek	5/7/03	0.1	0.23	8.25		38.3		19.2		4	Tug Fork	46.9
WVMTB	0.7	Buckhannon River	9/5/02	0.24	0.25	7.99		39		6.13	<	3	Tygart Valley	
WVMW-2	0.2	Booths Creek	3/19/01	0.096	0.256	7.56		39.4		10.1		2.8	West Fork	
WVKE-76	11.9	Birch River	9/3/02	0.2	0.27	7.85		40.6		18.2	<	3	Elk	
WVKG-19-V-4	0	Cutlip Branch	7/24/03	0.12	1.27	7.53		44.1				10	Gauley	
WVPNB-17-B		Mill Run	8/13/97	0.1	0.05	7.80		45			<	5	North Branch	84.13
WVKE-50	15.7	Buffalo Creek	9/11/02	0.75	0.78	4.82		49.1		25.9	<	3	Elk	43.42
WVKE-50	15.7	Buffalo Creek	9/11/02	0.75	0.78			50.6		26.2	<	3	Elk	33.47
WVMT-12	10.2	Three Fork Creek	9/2/97	3.836	7.3	4.30		51		16	<	5	Tygart Valley	36.66
WVK-61-J-5	0.6	UNT/Cane Fork RM 1.5	5/17/02	7.63	7.63	3.79		52.6		33.6	<	3	Upper Kanawha	63.17

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKG-19-V-4	0	Cutlip Branch	10/20/03	0.12	1.98	7.60		52.8				10	Gauley	
WVKE-50	0.7	Buffalo Creek	10/8/02	0.13	0.13	7.58		53.6		36.7	<	3	Elk	
WVMW-15-H		Jerry Run	3/19/01	0.146	0.24	8.51		55.4		14.7		1.4	West Fork	
WVPNB-16-A	0.8	Emory Run	8/14/97	1.812	1.8	4.70		59		28	<	5	North Branch	55.73
WVMW-7-B		Long Run	8/2/00	0.13	0.41	8.21		59.8		16.1		1	West Fork	60.41
WVK-75	0.9	Jarrett Branch	6/17/02	0.12	0.39	9.25		60.4		28.9		14	Upper Kanawha	47.61
WVPNB-16-C		Laurel Run	8/19/97	5.657	5.4	4.70	#	62	#	32		10	North Branch	54.09
WVMW-9.5		UNT/West Fork RM 13.9	3/22/01	0.122	1.38	7.04		62.4		18.3		11	West Fork	
WVMC-17-A-1	1	Glade Run	5/24/01	11.9	14.8	3.53		62.8		33.1		2	Cheat	15.57
WVPNB-16	18.1	Abrams Creek	8/18/97	1.064	0.82	3.90		63		24	<	5	North Branch	46.89
WVKC-35	3	White Oak Creek	10/8/97	0.13	0.26	7.80		66		53	<	5	Coal	51.08
WVKN-22-G-(3.6)-Discharge		Refuse Pile Discharge into White Oak Creek	4/1/02	10.3	11.3	4.21		67				8.4	Lower New	
WVPNB	52	North Branch Potomac River	8/27/97	0.206	0.44	7.50		67		13		15	North Branch	26
WVKG-19-V-4	0	Cutlip Branch	11/3/03	0.13	1.81	7.54		68.7				6	Gauley	
WVMW-24		Coburns Creek	3/21/01	0.094	13.3	7.60		70.8		16		384	West Fork	
WVMW-13-E		Katys Lick Creek	3/21/01	0.135	1.85	7.95		73.7		18.6		46	West Fork	
WVPNB-16	5.4	Abrams Creek	8/14/97	0.601	0.71	5.10		75		23	<	5	North Branch	41.5
WVKE-50	0.7	Buffalo Creek	9/4/02	0.16	0.18	7.68		77.1		52	<	3	Elk	
WVMC-17	0	Muddy Creek	6/25/01	9.27	10.2	3.44		77.2		29.8		5	Cheat	
WVKG-19-V-4	0	Cutlip Branch	9/3/03	0.17	1.48	7.60		78.6				7	Gauley	
WVMW-22		Davisson Run/West Fork	3/21/01	0.158	30	7.65		80.1		17.6		1168	West Fork	
WVMW-15	6.6	Simpson Creek	3/20/01	0.089	0.466	8.10		81		21.9		5.7	West Fork	
WVMC-17-A-0.5	3	Fickey Run	5/1/01	15.1	17.7	2.95		82.3		21.8	<	1	Cheat	41.41
WVMW-15	0.4	Simpson Creek	3/20/01	0.149	0.463	8.07		85.1		22.9		1.7	West Fork	
WVMW-7.1		UNT/West Fork River RM 11.44	3/22/01	0.098	1.26	7.01		86.7		31.9		10.5	West Fork	
WVMW-11-F		6th UNT/Shinns Run	3/20/01	7.08	7.25	3.51		93.3		29.3		9.8	West Fork	
WVMW-2-C		Sweep Run	3/21/01	0.122	4.86	7.41		94.7		27.4		72	West Fork	
WVMC-17	2	Muddy Creek	7/1/03	11.2	13.4	4.38		97.6		37.2		34	Cheat	36.58
WVMW-15	17.2	Simpson Creek	3/19/01	0.089	1.15	7.44		100.2		28		12.5	West Fork	
WVOG-75-L		Middle Fork/Buffalo Creek	8/28/00	0.95	6.68	4.99		113.4		58.16		5	Upper	38.81
WVMW-11	3.8	Shinns Run	3/19/01	3.57	5.48	4.05		118.4		32.4		21	West Fork	
WVMW-15-J.5		UNT/Simpson Creek RM 21.92	3/20/01	0.088	0.736	7.98		119.5		40.1		18	West Fork	
WVMW-15	25.4	Simpson Creek	3/19/01	0.121	2.42	7.84		122.7		33		36	West Fork	
WVMW-15-K.7		UNT/Simpson Creek RM 23.1	8/8/00	0.11	0.18	7.45		124		37.7		2	West Fork	52.95
WVMW-15-L		West Branch/Simpson Creek	3/20/01	0.138	1.53	7.78		125		34.6		16	West Fork	
WVMW-11	3	Shinns Run	3/19/01	0.873	4.5	5.43		127.8		35.7		29.5	West Fork	
WVMW-11	6.07	Shinns Run	7/31/00	1.41	5.25	4.63		128		34.4		32	West Fork	
WVMW-11	6.06	Shinns Run	3/20/01	6.47	7.04	4.25		135.7		40.6		29	West Fork	
WVMW-15-N		UNT/Simpson Creek RM 26.94	3/19/01	0.144	0.916	7.76		139.9		42.6		19.5	West Fork	
WVMW-11	5.5	Shinns Run	3/20/01	0.154	3.33	5.86		140.6		38.8		19	West Fork	
WVMW-15	0.4	Simpson Creek	8/1/00	0.27	0.54	8.20		142		39.9	<	1	West Fork	38.5
WVMW-11	3.8	Shinns Run	7/31/00	1.73	5.15	4.78		143		50.6		19	West Fork	20.58

AMDCode	Mile Point	Stream Name	Date	Dis Al (lb)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVMW-15-L		West Branch/Simpson Creek	8/8/00	0.13	0.66	7.93		148		40.1		10	West Fork	56.45
WVMW-11	6.06	Shinns Run	7/31/00	0.48	3.32	5.82		157		45.3		24	West Fork	51.62
WVMT-42-B-1	1.3	UNT/Flatbush Fork	8/25/97	19.604	0.42	3.30		160		27	<	5	Tygart Valley	35.08
WVMW-11-E-(0.1)-Mine		Mine Discharge into Nixon Run	3/20/01	11.7	12.1	3.33		163.8		42.6		2	West Fork	
WVMW-11-D.5		UNT/Shinns Run	3/19/01	14.3	15.1	3.65		173.9		56.9		4	West Fork	
WVMW-11-D.5		UNT/Shinns Run	7/31/00	14.6	16.3	3.18		179		60.6	<	1	West Fork	
WVMW-21-E		Turkey Run/Elk Creek	3/20/01	0.096	0.212	7.96		179.9		39.7		16.3	West Fork	
WVMW-15-0.5A		UNT/Simpson Creek RM 1.23	8/1/00	4.57	5.03	4.60		189		53.2		4	West Fork	25.76
WVMW-15-0.5A		UNT/Simpson Creek RM 1.23	3/20/01	5.53	5.91	4.55		192.9		55.8		8.2	West Fork	
WVMW-31	24.2	Hackers Creek	3/19/01	0.127	0.287	7.94		193.3		50.2		11.8	West Fork	
WVMW-21-Q		Isaacs Run	3/20/01	0.089	0.109	7.95		196.6		62.9	<	1	West Fork	
WVMW-11-E	0.1	Nixon Run	8/2/00	11.8	13.9	2.91		201		51.8		2	West Fork	14.59
WVMW-11	6.43	Shinns Run	3/20/01	27.4	27.7	3.04		202.2		70.3		12	West Fork	
WVMW-15-J-0.3		UNT/Right Fork RM 1.97/Simpson	3/20/01	13	13	3.48		202.4		52.2		2.4	West Fork	
WVMC-17-A	2.4	Martin Creek	6/20/01	3.33	3.92	4.02		203		74.4		2	Cheat	
WVMW-15-B		Smith Run/Simpson Creek	3/20/01	3.95	7.88	5.24		208.4		57.2		48	West Fork	
WVPNB	88.9	North Branch Potomac River	8/11/97	0.14	0.05	7.80		210		34		8	North Branch	53.97
WVMW-12	2.6	Robinson Run	3/20/01	0.092	0.506	7.74		217.7		48.1		11	West Fork	
WVMW-16-B	0.1	UNT/Lambert Run RM 2.8	8/15/00	0.27	3.09	6.92		219		61		23	West Fork	49.82
WVMW-15-J-0.3		UNT/Right Fork RM 1.97/Simpson	8/8/00	14.8	15.5	3.35		222		56.3		1	West Fork	33.25
WVMW-13-0.5A		Jack Run/Tenmile Creek	8/1/00	0.09	1.45	7.36		224		44.9		24	West Fork	43.06
WVMW-15-J-1		Buck Run	8/7/00	0.16	3.82	6.65		230		69.2		1	West Fork	48.77
WVMW-11-F		6th UNT/Shinns Run	8/3/00	13.3	14.1	2.84		231		62.5		8	West Fork	24.45
WVMW-11-E	0.1	Nixon Run	3/20/01	32.8	34.3	2.82		233.1		75		2	West Fork	
WVMW-11-(6.06)-Mine		Mine Discharge into Shinns Run	7/31/00	0.35	0.69	4.09		239		80.5		13	West Fork	
WVMW-9.5		UNT/West Fork RM 13.9	8/1/00	0.53	5.12	5.39		242		55.8		27	West Fork	43.04
WVMW-11	6.43	Shinns Run	8/2/00	18.7	22.1	3.06		254		75.6		62	West Fork	
WVMW-15-B		Smith Run/Simpson Creek	8/1/00	2.21	4.63	4.92		259		76.7		18	West Fork	24.52
WVMW-15-N		UNT/Simpson Creek RM 26.94	8/8/00	5.85	6.56	4.51		281		66.4		3	West Fork	43.72
WVPNB-17-D-(13.2)-Discharge		Laurel Run Mine Pond Discharge	8/18/03	0.196	0.27	8.25		282		52.1		3	North Branch Potomac	
WVPNB-17-D-(13.2)-Discharge		Laurel Run Mine Pond Discharge	8/22/03	0.169	0.274	8.09		283		51.2		9	North Branch Potomac	
WVMW-15-N		UNT/Simpson Creek RM 26.94	8/8/00	5.66	6.55			300		66.8		4	West Fork	44.3
WVMW-21-A	0.7	Murphy Run	6/26/02	8.65	8.65	4.65		318		66.3		21.2	West Fork	46.56
WVO-91		Harrison Run	7/19/00	0.31	0.47	7.98		410		97			Upper Ohio	27.86
WVMC-17-A-(2.2)-Mine	0.2	Mine Channel into Martin Creek	6/20/01	10.6	11.5	3.39		427		265	<	1	Cheat	
WVBST-24	16.8	Pigeon Creek	9/22/03	0.15	0.2	8.47						5	Tug Fork	54.55
WVBST-24	21.8	Pigeon Creek	9/16/03	0.16	0.21	8.52					<	3	Tug Fork	55.96
WVBST-24	21.8	Pigeon Creek	9/16/03	0.16	0.196	8.52						4	Tug Fork	58.66
WVBST-24	23.4	Pigeon Creek	3/30/04	0.12	1.05	8.54						37	Tug Fork	
WVBST-24	23.4	Pigeon Creek	3/15/04	0.15	0.22	8.63						3	Tug Fork	
WVBST-24	23.4	Pigeon Creek	4/29/04	0.15	0.28	9.00						4	Tug Fork	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVBST-40	3.5	Mate Creek	9/24/03	0.1	0.15	7.86						3	Tug Fork	59.54
WVBST-40	3.2	Mate Creek	4/1/04	0.09	0.44	8.13						5	Tug Fork	
WVBST-40	3.2	Mate Creek	4/27/04	0.1	0.33	8.34					<	3	Tug Fork	
WVK	54.4	Kanawha River	1/21/03	0.16	0.2	7.39					<	3	Lower Kanawha	
WVK	32.2	Kanawha River	4/22/03	0.1	0.63	7.45						11	Lower Kanawha	
WVK-41	3.4	Twomile Creek	4/2/03	0.16	0.31	7.70						5	Lower Kanawha	
WVK-41	3.4	Twomile Creek	5/13/03	0.12	0.28	8.44					<	3	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	2/26/03	13.2	13.6	3.58						4	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	4/2/03	9.1	9.4	4.32					<	3	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	5/14/03	9.24	10.2	4.36						3	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	4/18/03	8.67	8.81	4.61						15	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	12/18/02	5.67	6.11	4.61						6	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	1/21/03	7.02	7.05	4.87					<	3	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	11/21/02	3.44	3.73	4.96						9	Lower Kanawha	
WVK-41-D.5	0	Rich Fork	2/26/03	5.14	5.97	5.04						17	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	10/16/02	1.14	3.24	5.22						30	Lower Kanawha	
WVK-41-D.5	1	Rich Fork	11/6/02	1.06	3.61	5.40						33	Lower Kanawha	
WVK-41-D.5	0	Rich Fork	12/16/02	0.3	1.9	7.20						18	Lower Kanawha	
WVK-41-D.5	0	Rich Fork	10/16/02	0.09	1.94	7.42						49	Lower Kanawha	
WVK-41-D.5-3	0	UNT/Rich Fork RM 1.0	2/26/03	4.69	5.21	5.00						15	Lower Kanawha	
WVK-49	10.2	Campbells Creek	7/30/01	0.13	1.1	6.95						29	Upper Kanawha	
WVK-49	0.2	Campbells Creek	9/24/01	0.174	0.289	7.56					<	5	Upper Kanawha	
WVK-49	5.4	Campbells Creek	9/26/01	0.093	0.178	7.71					<	5	Upper Kanawha	
WVK-49	3	Campbells Creek	9/25/01	0.118	0.175	7.87					<	5	Upper Kanawha	
WVK-49-A	0	Dry Branch	8/1/01	0.11	0.54	7.12						8	Upper Kanawha	
WVK-49-A	0.1	Dry Branch	12/6/01	7.58	9.56	7.28					<	5	Upper Kanawha	
WVK-49-A	0	Dry Branch	9/24/01	0.213	0.328	7.79						7	Upper Kanawha	
WVK-49-A-(0.1)-Mine		Mine Discharge into Dry Branch	9/24/01	0.165	0.23	7.22					<	5	Upper Kanawha	
WVK-49-B	0.2	Spring Fork	8/1/01	0.11	0.26	7.35						8	Upper Kanawha	
WVK-49-B	1.6	Spring Fork	9/24/01	0.192	2.88	7.47						43	Upper Kanawha	
WVK-49-B	0.2	Spring Fork	9/24/01	0.201	0.834	7.93						8	Upper Kanawha	
WVK-49-B-2-A	0	UNT/Left Fork RM 0.2/Spring Fork	9/25/01	0.105	0.605	7.14						17	Upper Kanawha	
WVK-49-F	1.2	Pointlick Fork	9/25/01	0.117	0.161	7.26					<	5	Upper Kanawha	
WVK-49-F	2.3	Pointlick Fork	9/25/01	0.12	0.12	7.28						7	Upper Kanawha	
WVK-49-F	0	Pointlick Fork	9/25/01	0.136	0.136	7.54					<	5	Upper Kanawha	
WVK-49-F-4	0	UNT/Pointlick Fork RM 2.4	9/25/01	0.16	0.846	7.64						29	Upper Kanawha	
WVK-49-I	0	Rattlesnake Hollow	9/26/01	0.14	0.16	7.45					<	5	Upper Kanawha	
WVK-49-J	0	UNT/Campbells Creek RM 7.5	7/30/01	0.11	1.34	7.09						35	Upper Kanawha	
WVK-53	3.8	Lens Creek	10/10/01	0.163	0.164	8.11						5	Upper Kanawha	
WVK-53-A	0	Left Fork/Lens Creek	10/10/01	0.113	0.113	8.05					<	5	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	6/3/02	27.3	27.3	3.23					<	3	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	9/6/01	10.4	10.4	3.29					<	5	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	8/14/01	7.81	7.87	3.79					<	5	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	10/15/01	4.5	5.72	4.12					<	5	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	12/5/01	2.5	3.16	4.26						27	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	11/19/01	3.04	3.89	4.40					<	5	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	3/29/02	3.62	4	4.64						5.2	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	3/13/02	2	2.19	4.87					<	3	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	2/20/02	2.77	2.95	4.98					<	3	Upper Kanawha	
WVK-53-A-0.4	0	UNT/Left Fork RM 1.8/Lens Creek	1/23/02	0.268	1.41	5.93						32.4	Upper Kanawha	
WVK-57	5.1	Witcher Creek	7/30/01	0.4	0.94	4.61					<	5	Upper Kanawha	
WVK-57	5.1	Witcher Creek	7/18/01	0.6	0.67	4.91						5	Upper Kanawha	
WVK-57	5.1	Witcher Creek	5/7/02	0.32	0.95	5.33						17.6	Upper Kanawha	
WVK-57	5.1	Witcher Creek	2/26/02	0.63	0.68	5.71					<	3	Upper Kanawha	
WVK-57	5.1	Witcher Creek	3/6/02	0.46	0.49	5.73					<	3	Upper Kanawha	
WVK-57	5.1	Witcher Creek	4/8/02	0.34	0.42	5.94					<	3	Upper Kanawha	
WVK-57	5.1	Witcher Creek	12/20/01	0.517	0.656	6.10					<	5	Upper Kanawha	
WVK-57	5.1	Witcher Creek	1/24/02	0.3	1.12	6.11						26.4	Upper Kanawha	
WVK-57	0.7	Witcher Creek	7/30/01	0.12	1	6.91						21	Upper Kanawha	
WVK-57	0.7	Witcher Creek	9/24/01	0.144	0.217	7.53					<	5	Upper Kanawha	
WVK-57-A	0	Dry Branch	7/30/01	0.13	0.59	6.99						9	Upper Kanawha	
WVK-57-A	0	Dry Branch	9/24/01	0.15	0.232	7.82					<	5	Upper Kanawha	
WVK-57-C	0	Left Fork/Witcher Creek	7/30/01	0.14	1.09	5.79						15	Upper Kanawha	
WVK-57-D.5	0	UNT/Witcher Creek RM 5.2	7/30/01	0.34	0.98	4.87						19	Upper Kanawha	
WVK-57-D.5	0	UNT/Witcher Creek RM 5.2	7/18/01	0.14	0.42	5.15						6	Upper Kanawha	
WVK-58	0.2	Fields Creek	3/15/02	0.1	0.26	6.93					<	3	Upper Kanawha	
WVK-58	0.2	Fields Creek	2/25/02	0.31	0.4	6.97						3.2	Upper Kanawha	
WVK-58	0.2	Fields Creek	6/12/02	0.1	0.14	7.72					<	3	Upper Kanawha	
WVK-58	5.9	Fields Creek	10/10/01	0.09	0.103	8.35					<	5	Upper Kanawha	
WVK-58	3.5	Fields Creek	10/10/01	0.12	0.12	8.76					<	5	Upper Kanawha	
WVK-58	1.5	Fields Creek	10/10/01	0.111	0.216	9.21					<	5	Upper Kanawha	
WVK-58	0.2	Fields Creek	2/25/02	0.33	0.53						<	3	Upper Kanawha	
WVK-58	0.2	Fields Creek	6/12/02	0.11	0.13						<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	9/5/01	11.3	11.5	4.09					<	5	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	1/29/02	6.52	6.54	4.25					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	12/14/01	15.1	19.4	4.25						28	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	6/12/02	13.3	13.3	4.29					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	8/15/01	9.6	10	4.36					<	5	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	7/18/01	11	10.7	4.52					<	5	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	11/14/01	14.2	18.9	4.61						6	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	4/8/02	3.59	3.68	4.72					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	5/1/02	2.46	2.46	4.77					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	2/25/02	11.9	12.3	4.93					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	3/15/02	11.2	11.3	5.26					<	3	Upper Kanawha	
WVK-58-B.1	0	Wolfpen Branch	10/10/01	11.2	13	5.52					<	5	Upper Kanawha	

AU Code	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-58-B.8	0	Mill Branch	6/12/02	0.1	0.33	7.80						13.2	Upper Kanawha	
WVK-58-B.8	0	Mill Branch	10/10/01	0.089	0.127	8.34						10	Upper Kanawha	
WVK-59	1.6	Carroll Branch	6/3/02	10.4	10.4	3.26						3	Upper Kanawha	
WVK-59	1.6	Carroll Branch	7/30/01	5.7	5.7	3.27						< 5	Upper Kanawha	
WVK-59	1.6	Carroll Branch	5/6/02	8.98	8.98	3.34						18.4	Upper Kanawha	
WVK-59	1.6	Carroll Branch	9/4/01	7.17	7.52	3.49						5	Upper Kanawha	
WVK-59	1.6	Carroll Branch	12/6/01	7.58	9.56	3.53						< 5	Upper Kanawha	
WVK-59	1.6	Carroll Branch	7/18/01	5.63	5.69	3.56						< 5	Upper Kanawha	
WVK-59	1.6	Carroll Branch	3/15/02	7.83	7.96	3.60						< 3	Upper Kanawha	
WVK-59	1.6	Carroll Branch	4/1/02	4.36	4.48	3.60						8.4	Upper Kanawha	
WVK-59	1.6	Carroll Branch	1/22/02	7.5	7.763	3.61						< 3	Upper Kanawha	
WVK-59	1.6	Carroll Branch	2/19/02	8.13	8.15	3.76						< 3	Upper Kanawha	
WVK-59	1.6	Carroll Branch	11/13/01	7.46	10.3	3.86						< 5	Upper Kanawha	
WVK-59	0.1	Carroll Branch	6/13/02	4.8	5.5	4.69						7.6	Upper Kanawha	
WVK-59	0.1	Carroll Branch	5/6/02	4.16	4.33	4.77						4.4	Upper Kanawha	
WVK-59	1.6	Carroll Branch	10/11/01	8.01	8.98	5.01						13	Upper Kanawha	
WVK-59	0.1	Carroll Branch	4/1/02	0.2	1.62	5.71						25.6	Upper Kanawha	
WVK-59	0.1	Carroll Branch	7/18/01	0.11	2.77	5.81						20	Upper Kanawha	
WVK-59	0.1	Carroll Branch	7/30/01	0.1	2.02	6.22						35	Upper Kanawha	
WVK-59	0.1	Carroll Branch	2/19/02	0.09	1.55	6.91						3.2	Upper Kanawha	
WVK-59	0.1	Carroll Branch	10/11/01	0.19	9.22	8.68						1217	Upper Kanawha	
WVK-59	0.1	Carroll Branch	4/1/02	0.19	1.59							30.8	Upper Kanawha	
WVK-60	4.3	Slaughter Creek	10/10/01	0.136	0.244	6.58						< 5	Upper Kanawha	
WVK-60	3	Slaughter Creek	10/9/01	0.091	0.091	7.05						< 5	Upper Kanawha	
WVK-60	0.3	Slaughter Creek	6/13/02	0.11	0.17	7.07						< 3	Upper Kanawha	
WVK-60	3	Slaughter Creek	6/13/02	0.09	0.57	7.07						< 3	Upper Kanawha	
WVK-60	0.3	Slaughter Creek	10/10/01	0.107	0.167	7.97						7	Upper Kanawha	
WVK-60-A	0	Little Creek	3/14/02	1.07	5.9	4.89						23.6	Upper Kanawha	
WVK-60-A	0.8	Little Creek	5/1/02	1.57	1.84	5.07						< 3	Upper Kanawha	
WVK-60-A	0	Little Creek	4/2/02	1.04	1.61	5.13						9.2	Upper Kanawha	
WVK-60-A	0	Little Creek	5/1/02	3.86	3.86	5.14						< 3	Upper Kanawha	
WVK-60-A	0.8	Little Creek	4/4/02	1.44	1.79	5.18						3.2	Upper Kanawha	
WVK-60-A	0	Little Creek	2/25/02	1.5	2.98	5.18						8.4	Upper Kanawha	
WVK-60-A	0	Little Creek	1/28/02	1.45	2.09	5.20						6	Upper Kanawha	
WVK-60-A	0.8	Little Creek	1/28/02	0.901	1.45	5.41						< 3	Upper Kanawha	
WVK-60-A	0.8	Little Creek	3/14/02	0.18	1.68	5.87						4.8	Upper Kanawha	
WVK-60-A	0.8	Little Creek	2/25/02	0.33	1.68	6.34						6.4	Upper Kanawha	
WVK-60-A	0	Little Creek	6/13/02	0.12	0.58	6.99						< 3	Upper Kanawha	
WVK-60-A	0.8	Little Creek	10/9/01	0.227	0.273	7.65						< 5	Upper Kanawha	
WVK-60-A	0	Little Creek	10/9/01	0.205	0.352	7.85						< 5	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	3/14/02	11.7	11.8	4.04						< 3	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	9/4/01	22.1	21.1	4.11						<5	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	6/13/02	13.6	14.2	4.29						<3	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	1/28/02	6.71	6.79	4.33						5.6	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	2/25/02	12	12.2	4.38						<3	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	12/13/01	21.1	26.8	4.39						<5	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	11/13/01	34.3	34.7	4.40						10	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	10/9/01	12.5	26.2	4.43						10	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	5/1/02	1.26	1.91	4.44						<3	Upper Kanawha	
WVK-60-A-1	0	UNT/Little Creek RM 0.4 (Little Branch)	4/2/02	2.72	3.43	4.50						<3	Upper Kanawha	
WVK-60-B	0	Bradley Fork	3/14/02	0.88	1.14	4.95						<3	Upper Kanawha	
WVK-60-B	0	Bradley Fork	2/21/02	1.11	1.22	5.30						<3	Upper Kanawha	
WVK-60-B	0	Bradley Fork	1/28/02	0.79	1.08	5.34						<3	Upper Kanawha	
WVK-60-B	0	Bradley Fork	4/2/02	0.18	0.76	5.58						8	Upper Kanawha	
WVK-60-B	0	Bradley Fork	12/12/01	0.158	0.31	5.96						<5	Upper Kanawha	
WVK-60-B	0	Bradley Fork	10/9/01	0.095	0.287	6.76						5	Upper Kanawha	
WVK-60-B	0	Bradley Fork	6/12/02	0.13	1.3	7.12						4.8	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	9/6/01	6.16	6.47	4.12						<5	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	9/6/01	5.64	8.25	4.24						<5	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	3/14/02	10.9	11	4.25						<3	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	6/13/02	18.9	18.9	4.26						<3	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	3/14/02	10.8	11.7	4.28						<3	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	8/7/01	14	14.7	4.32						<5	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	10/10/01	18.6	23	4.41						<5	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	10/10/01	17.3	22.1	4.41						<5	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	7/25/01	19.3	20.4	4.43						<5	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	4/2/02	9.29	9.38	4.44						<3	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	12/12/01	11.1	16.4	4.44						<5	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	5/1/02	13.9	14.6	4.46						<3	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	11/26/01	12.1	14.7	4.48						<5	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	11/26/01	11.3	14.8	4.49						<5	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	12/12/01	12.1	16	4.55						<5	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	1/28/02	8.65	9.26	4.57						<3	Upper Kanawha	
WVK-60-B.1	0.1	UNT/Slaughter Creek RM 3.1	2/21/02	8.64	9.11	4.59						3.2	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	2/21/02	7.94	8.24	4.68						<3	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	1/28/02	8.4	8.92	4.70						<3	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	4/2/02	1.98	8.92	4.71						19.6	Upper Kanawha	
WVK-60-B.1	0	UNT/Slaughter Creek RM 3.1	8/7/01	0.79	17.8	8.72						79	Upper Kanawha	
WVK-60-C	0	Dotson Fork	4/2/02	0.15	0.8	5.79						14	Upper Kanawha	
WVK-61	14.1	Cabin Creek	9/13/01	0.22	3.71	6.02						38	Upper Kanawha	
WVK-61	10.1	Cabin Creek	6/5/02	0.11	2.12	6.57						16.8	Upper Kanawha	
WVK-61	7.3	Cabin Creek	9/13/01	0.13	0.54	6.89						6	Upper Kanawha	
WVK-61	9.9	Cabin Creek	9/13/01	0.17	1.51	7.13						12	Upper Kanawha	
WVK-61	17.5	Cabin Creek	10/10/01	0.217	6.06	7.26						33	Upper Kanawha	
WVK-61	10.1	Cabin Creek	9/13/01	0.3	1.3	7.28						15	Upper Kanawha	
WVK-61	6.4	Cabin Creek	9/13/01	0.19	0.46	7.35						10	Upper Kanawha	
WVK-61	15.2	Cabin Creek	10/10/01	0.101	4.36	7.35						40	Upper Kanawha	
WVK-61	14.1	Cabin Creek	10/10/01	0.126	3.36	7.38						35	Upper Kanawha	
WVK-61	9.9	Cabin Creek	6/5/02	0.12	2.1	7.41						17.6	Upper Kanawha	
WVK-61	10.1	Cabin Creek	10/10/01	0.143	1.02	7.57						16	Upper Kanawha	
WVK-61	12.7	Cabin Creek	9/13/01	0.22	1.99	7.58						16	Upper Kanawha	
WVK-61	12.7	Cabin Creek	10/10/01	0.112	1.63	7.61						20	Upper Kanawha	
WVK-61	9.9	Cabin Creek	10/11/01	0.128	1.07	7.65					<	5	Upper Kanawha	
WVK-61	12.7	Cabin Creek	5/1/02	0.09	1.38	7.71						20.4	Upper Kanawha	
WVK-61	12.7	Cabin Creek	6/7/02	0.1	1.85	7.71						30	Upper Kanawha	
WVK-61	19.8	Cabin Creek	10/11/01	0.111	0.132	7.75						7	Upper Kanawha	
WVK-61	7.3	Cabin Creek	6/5/02	0.13	1.36	7.78						12	Upper Kanawha	
WVK-61	4.7	Cabin Creek	10/10/01	0.099	0.179	7.80					<	5	Upper Kanawha	
WVK-61	0.9	Cabin Creek	10/10/01	0.197	0.275	7.82					<	5	Upper Kanawha	
WVK-61	6.4	Cabin Creek	10/9/01	0.108	0.29	7.83						5	Upper Kanawha	
WVK-61	7.3	Cabin Creek	10/9/01	0.145	0.427	7.84						7	Upper Kanawha	
WVK-61	6.4	Cabin Creek	6/5/02	0.14	1.13	7.85						8.4	Upper Kanawha	
WVK-61	17.8	Cabin Creek	10/10/01	0.112	0.112	7.88					<	5	Upper Kanawha	
WVK-61	2.6	Cabin Creek	10/10/01	0.122	0.181	8.06						5	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	9/4/01	14.8	15.5	3.97						21	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	7/31/01	15	18	4.37						27	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	12/13/01	16.3	20.6	4.45						11	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	12/13/01	16.3	20.6	4.45						11	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	7/17/01	13.2	14.5	4.50						20	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	4/8/02	12.5	13.7	4.62						49.2	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	11/13/01	13	19.3	4.67						89	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	4/30/02	8.51	11.5	4.73						16.8	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	3/12/02	5.86	11.9	5.11						91.6	Upper Kanawha	
WVK-61.5	0	Hicks Hollow	10/11/01	15.4	19.8	5.53						36	Upper Kanawha	
WVK-61-B	0	Dry Branch	6/7/02	0.11	0.26	7.73						4.8	Upper Kanawha	
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	6/7/02	1.06	1.92	5.17						20.4	Upper Kanawha	
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	5/7/02	0.82	2.52	5.20						80.4	Upper Kanawha	

AMD Code	Mile Point	Stream Name	Date	Dis Al (L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	3/28/02	1.04	1.2	5.28						6.4	Upper Kanawha	
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	2/28/02	0.24	0.61	7.18						4.8	Upper Kanawha	
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	1/23/02	0.255	0.694	7.41						12.4	Upper Kanawha	
WVK-61-B-1	0	UNT/Dry Branch RM 0.7 (Coalburg Branch)	3/5/02	0.22	0.4	7.92						4	Upper Kanawha	
WVK-61-E	0	Paint Branch	10/9/01	0.1	0.119	7.82						<5	Upper Kanawha	
WVK-61-F	0	Longbottom Creek	10/9/01	0.1	0.1	7.76						<5	Upper Kanawha	
WVK-61-F	0.8	Longbottom Creek	10/9/01	0.093	0.05	7.78						<5	Upper Kanawha	
WVK-61-G	0	Greens Branch	10/9/01	0.153	0.479	7.74						<5	Upper Kanawha	
WVK-61-H	4.8	Coal Fork	10/2/01	0.192	0.338	6.61						<5	Upper Kanawha	56.6
WVK-61-H	0	Coal Fork	10/9/01	0.123	0.123	7.33						<5	Upper Kanawha	
WVK-61-H	0	Coal Fork	9/24/01	0.29	0.666	7.34						12	Upper Kanawha	
WVK-61-H-1	0	Laurel Fork/Coal Fork	10/9/01	0.141	0.164	7.14						<5	Upper Kanawha	
WVK-61-H-1	0	Laurel Fork/Coal Fork	9/24/01	0.231	0.527	7.38						25	Upper Kanawha	
WVK-61-H-3	0	UNT/Coal Fork RM 4.6	5/1/02	0.68	3.13	5.43						34	Upper Kanawha	
WVK-61-H-3	0	UNT/Coal Fork RM 4.6	10/1/01	0.139	0.492	6.83						10	Upper Kanawha	
WVK-61-H-3	0	UNT/Coal Fork RM 4.6	6/5/02	0.11	0.18	7.66						4.8	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	1/22/02	0.552	0.819	5.28						4	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	12/18/01	0.597	0.888	5.32						<5	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	2/25/02	0.4	0.67	5.35						<3	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	3/12/02	0.47	0.74	5.58						<3	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	3/29/02	0.37	0.57	5.68						<3	Upper Kanawha	
WVK-61-I	0.1	Bear Hollow	5/2/02	0.1	0.37	5.98						8	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	12/18/01	2.47	3.44	4.86						<5	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	3/13/02	2.15	2.58	4.91						3.2	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	2/25/02	2.08	2.71	4.93						<3	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	5/2/02	0.29	0.6	5.18						6	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	1/22/02	2.13	2.43	5.47						8	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	11/26/01	0.236	0.332	5.95						<5	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	4/4/02	0.38	0.56	6.16						3.2	Upper Kanawha	
WVK-61-I-1	0	UNT/Bear Hollow RM 0.3	3/13/02	2.23	2.56							<3	Upper Kanawha	
WVK-61-J	0	Cane Fork	8/9/01	13.4	13.2	3.03						<5	Upper Kanawha	
WVK-61-J	0.4	Cane Fork	8/9/01	20.9	21.2	3.15						5	Upper Kanawha	
WVK-61-J	0	Cane Fork	4/4/02	23.5	23.6	3.24						16.4	Upper Kanawha	
WVK-61-J	0	Cane Fork	9/13/01	6.69	7.28	3.31						<5	Upper Kanawha	
WVK-61-J	0.4	Cane Fork	9/13/01	6.31	6.61	3.36						6	Upper Kanawha	
WVK-61-J	0	Cane Fork	4/30/02	8.8	9.15	3.46						8	Upper Kanawha	
WVK-61-J	0	Cane Fork	7/19/01	6.49	6.73	3.54						8	Upper Kanawha	
WVK-61-J	0	Cane Fork	6/5/02	7.53	7.53	3.54						4.4	Upper Kanawha	
WVK-61-J	0	Cane Fork	2/20/02	7.93	8.58	3.56						5.6	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-61-J	0	Cane Fork	3/8/02	9.13	9.75	3.67					<	3	Upper Kanawha	
WVK-61-J	0	Cane Fork	10/11/01	5.83	7	3.69					<	5	Upper Kanawha	
WVK-61-J	0	Cane Fork	11/26/01	5.06	6.44	3.78					<	5	Upper Kanawha	
WVK-61-J	0	Cane Fork	1/22/02	5.13	5.62	3.80					<	3	Upper Kanawha	
WVK-61-J	0	Cane Fork	12/18/01	2.54	3.1	4.40					<	5	Upper Kanawha	
WVK-61-J-1	0	UNT/Cane Fork RM 0.4	8/9/01	11.5	11.7	2.97					<	5	Upper Kanawha	
WVK-61-J-5	0	UNT/Cane Fork RM 1.5	7/19/01	1.48	3.31	5.18						7	Upper Kanawha	
WVK-61-K	0	Toms Fork	11/2/01	11.3	14.8	7.55					<	5	Upper Kanawha	
WVK-61-K	0	Toms Fork	10/11/01	0.104	0.234	7.71					<	5	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	1/17/02	0.093	0.419	7.76						10	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	4/2/02	0.1	0.65	7.79						26.8	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	12/18/01	0.0893	0.984	7.85						49	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	5/1/02	0.19	1.01	7.97						20.8	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	7/19/01	0.13	0.6	7.97						26	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	5/1/02	0.09	0.19	7.99						16	Upper Kanawha	
WVK-61-L	4.7	Tenmile Fork	10/10/01	0.148	0.208	8.05					<	5	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	2/25/02	0.13	0.32	8.08					<	3	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	10/11/01	0.275	0.457	8.11						5	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	6/4/02	0.25	0.62	8.12						10.8	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	9/10/01	0.103	0.49	8.13						10	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	3/12/02	0.12	0.38	8.13						9.6	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	6/4/02	0.28	0.72	8.15						12	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	2/25/02	0.13	0.49	8.17					<	3	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	7/19/01	0.22	0.78	8.18						40	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	3/12/02	0.11	0.39	8.22						7.2	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	10/10/01	0.19	0.456	8.23						9	Upper Kanawha	
WVK-61-L	0	Tenmile Fork	11/20/01	0.097	0.209	8.24					<	5	Upper Kanawha	
WVK-61-L	2.5	Tenmile Fork	2/25/02	0.12	0.49							3.6	Upper Kanawha	
WVK-61-L-0.5	0	UNT/Tenmile Fork RM 1.2	10/10/01	0.211	0.466	7.58						12	Upper Kanawha	
WVK-61-L-0.5	0	UNT/Tenmile Fork RM 1.2	10/4/01	0.33	0.58	7.60						17	Upper Kanawha	39.93
WVK-61-L-0.5	0	UNT/Tenmile Fork RM 1.2	3/8/02	0.1	0.34	7.95						3.2	Upper Kanawha	
WVK-61-L-0.5	0	UNT/Tenmile Fork RM 1.2	6/4/02	0.09	0.2	7.98					<	3	Upper Kanawha	
WVK-61-O	0.2	Fifteenmile Fork	12/17/01	0.427	9.04	5.09						36	Upper Kanawha	
WVK-61-O	0.2	Fifteenmile Fork	10/11/01	2.77	10.3	5.21						44	Upper Kanawha	
WVK-61-O	0.2	Fifteenmile Fork	11/15/01	1.3	8.28	5.30						47	Upper Kanawha	
WVK-61-O	0.2	Fifteenmile Fork	9/11/01	0.173	7.98	5.86						38	Upper Kanawha	
WVK-61-O	2.9	Fifteenmile Fork	2/19/02	0.1	7.27	7.70						26.4	Upper Kanawha	
WVK-61-O	1.3	Fifteenmile Fork	4/30/02	0.12	2.92	7.76						16.4	Upper Kanawha	
WVK-61-O	1.3	Fifteenmile Fork	4/4/02	0.11	1.4	7.78						14	Upper Kanawha	
WVK-61-O-1	0	Abbott Creek	12/17/01	9.2	10.8	3.27					<	5	Upper Kanawha	
WVK-61-O-1	0	Abbott Creek	11/14/01	8.07	10.3	3.40					<	5	Upper Kanawha	
WVK-61-O-1	0	Abbott Creek	10/11/01	1.82	4.66	5.50						21	Upper Kanawha	
WVK-61-O-1	0	Abbott Creek	1/16/02	2.2	3.3	6.06					<	5	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-62	0	Watson Branch	7/31/01	3.15	3.2	3.57						< 5	Upper Kanawha	
WVK-62	0	Watson Branch	4/8/02	13.1	13.2	3.60						< 3	Upper Kanawha	
WVK-62	0	Watson Branch	4/30/02	8.97	9.58	3.65						< 3	Upper Kanawha	
WVK-62	0	Watson Branch	2/21/02	5.75	6.63	4.69						< 3	Upper Kanawha	
WVK-62	0	Watson Branch	1/24/02	2.09	2.75	4.99						29.6	Upper Kanawha	
WVK-63	0	Mile Branch	7/31/01	0.142	0.83	6.07						< 5	Upper Kanawha	
WVK-63	0	Mile Branch	4/8/02	0.12	1.37	7.48						6	Upper Kanawha	
WVK-63	0	Mile Branch	6/12/02	0.09	0.38	8.15						< 3	Upper Kanawha	
WVK-70	2.4	Morris Creek	11/16/01	0.906	1.65	4.40						10	Upper Kanawha	
WVK-70	0.2	Morris Creek	11/13/01	0.208	0.619	5.99						6	Upper Kanawha	
WVK-70	3.3	Morris Creek	8/1/01	0.11	0.44	6.64						10	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	9/4/01	1.01	1.47	4.91						< 5	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	7/31/01	0.36	0.87	4.97						6	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	7/16/01	0.88	1.44	5.06						< 5	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	6/14/02	0.31	0.93	5.20						5.6	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	4/4/02	0.39	0.74	5.58						4.8	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	10/17/01	2.71	3.58	5.65						< 5	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	2/19/02	0.09	0.34	6.77						< 3	Upper Kanawha	
WVK-70-A	0	Schuyler Fork	5/1/02	0.16	0.63	7.07						4.4	Upper Kanawha	
WVK-71	0	Staten Run	10/11/01	0.191	0.211	8.26						16	Upper Kanawha	
WVK-72	0	Smithers Creek	9/13/01	0.27	0.64	6.80						< 5	Upper Kanawha	
WVK-72	1.7	Smithers Creek	9/13/01	0.1	0.19	7.28						< 5	Upper Kanawha	
WVK-72	1.7	Smithers Creek	10/10/01	0.108	0.108	7.87						< 5	Upper Kanawha	
WVK-72	0	Smithers Creek	11/19/01	0.107	0.281	7.96						< 5	Upper Kanawha	
WVK-72	0	Smithers Creek	2/21/02	0.1	0.17	8.13						< 3	Upper Kanawha	
WVK-72	0	Smithers Creek	12/10/01	0.102	0.23	8.16						< 5	Upper Kanawha	
WVK-72	0	Smithers Creek	3/14/02	0.13	0.21	8.18						5.2	Upper Kanawha	
WVK-72	0	Smithers Creek	10/11/01	0.163	0.683	8.31						< 5	Upper Kanawha	
WVK-72-A	0	Blake Branch	10/11/01	0.162	0.22	7.56						5	Upper Kanawha	
WVK-72-A	0	Blake Branch	9/12/01	0.25	0.252	7.59						< 5	Upper Kanawha	
WVK-72-A	0	Blake Branch	2/21/02	0.12	0.26	7.87						< 3	Upper Kanawha	
WVK-72-A	0	Blake Branch	6/11/02	0.13	0.4	7.93						48.4	Upper Kanawha	
WVK-72-A	0	Blake Branch	3/14/02	0.19	0.31	8.04						< 3	Upper Kanawha	
WVK-72-A	1.2	Blake Branch	9/13/01	0.2	0.23	8.12						10	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	8/15/01	1.88	1.95	4.90						< 5	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	6/11/02	0.63	1.62	5.17						18.4	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	4/30/02	0.66	1.14	5.34						8.8	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	9/13/01	0.21	0.22	6.12						< 5	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	10/11/01	1.32	1.59	6.40						9	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	11/20/01	0.633	0.991	6.88						8	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	4/3/02	0.1	1.13	7.18						42	Upper Kanawha	
WVK-72-A-(0.9)-Mine		Mine Discharge into Blake Branch	12/10/01	0.161	0.242	7.82						< 5	Upper Kanawha	
WVK-72-A-1	0	Fishhook Fork	1/24/02	4.24	6.3	4.90						132	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-72-A-1	0	Fishhook Fork	6/11/02	0.11	0.24	8.12						< 3	Upper Kanawha	
WVK-72-A-1	0	Fishhook Fork	9/13/01	0.12	0.12	8.34						5	Upper Kanawha	
WVK-72-A-1	0	Fishhook Fork	10/11/01	0.163	0.168	9.04						< 5	Upper Kanawha	
WVK-72-B	0	Bullpush Fork	9/13/01	0.22	0.22	6.85						< 5	Upper Kanawha	
WVK-72-B	0	Bullpush Fork	10/10/01	0.104	0.134	7.42						7	Upper Kanawha	
WVK-72-B	1.4	Bullpush Fork	10/9/01	0.102	0.219	8.31						5	Upper Kanawha	
WVK-72-B-2	0	Burnett Hollow	10/10/01	0.123	0.181	7.76						< 5	Upper Kanawha	
WVK-72-B-2	0	Burnett Hollow	9/12/01	0.19	0.8	8.03						< 5	Upper Kanawha	
WVK-73	8.6	Armstrong Creek	9/24/01	0.196	5.2	5.60						247	Upper Kanawha	
WVK-73	3.3	Armstrong Creek	3/7/02	0.09	0.35	6.28						3.6	Upper Kanawha	
WVK-73	4.4	Armstrong Creek	4/30/02	0.09	0.28	6.54						5.2	Upper Kanawha	
WVK-73	1.6	Armstrong Creek	4/30/02	0.09	0.56	6.71						10	Upper Kanawha	
WVK-73	5.9	Armstrong Creek	4/30/02	0.1	0.44	6.89						9.6	Upper Kanawha	
WVK-73	3.3	Armstrong Creek	4/30/02	0.09	0.62	6.96						12	Upper Kanawha	
WVK-73	0.3	Armstrong Creek	8/6/01	0.13	1.23	7.16						30	Upper Kanawha	
WVK-73	0.3	Armstrong Creek	7/24/01	0.64	0.67	7.60						25	Upper Kanawha	
WVK-73	3.3	Armstrong Creek	7/19/01	0.1	0.43	7.61						20	Upper Kanawha	
WVK-73	4.4	Armstrong Creek	8/6/01	0.1	0.71	7.63						22	Upper Kanawha	
WVK-73	0.3	Armstrong Creek	6/14/02	0.22	0.29	7.77						4.4	Upper Kanawha	
WVK-73	3.3	Armstrong Creek	6/11/02	0.22	0.32	8.04						< 3	Upper Kanawha	
WVK-73	5.9	Armstrong Creek	6/11/02	0.11	0.2	8.17						< 3	Upper Kanawha	
WVK-73	1.6	Armstrong Creek	6/11/02	0.24	0.3	8.24						< 3	Upper Kanawha	
WVK-73-A	0	Tucker Hollow	2/19/02	0.91	1.16	5.22						< 3	Upper Kanawha	
WVK-73-A	0	Tucker Hollow	3/7/02	1.35	1.5	5.25						4	Upper Kanawha	
WVK-73-A	0	Tucker Hollow	1/14/02	0.786	1.05	5.32						< 5	Upper Kanawha	
WVK-73-A	0	Tucker Hollow	4/3/02	0.22	0.45	5.71						< 3	Upper Kanawha	
WVK-73-A	0	Tucker Hollow	4/30/02	0.14	0.46	6.15						< 3	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	8/1/01	4.3	4.8	4.05						< 5	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	9/6/01	2.4	3.07	4.58						< 5	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	6/12/02	3.51	3.51	4.65						< 3	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	2/19/02	1.67	1.88	4.79						< 3	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	4/30/02	1.19	1.95	4.86						14	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	11/14/01	5.97	6.03	4.91						< 5	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	12/6/01	5.42	6.99	4.92						< 5	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	1/15/02	1.92	2.44	4.96						5	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	3/7/02	1.71	2.29	4.99						5.6	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	4/3/02	1.36	1.93	5.02						18.8	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	7/19/01	0.44	1.36	5.28						21	Upper Kanawha	
WVK-73-D	0	Jenkins Fork	10/17/01	2.97	3.82	6.15						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	8/1/01	2.9	3.2	3.81						7	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	9/6/01	5.96	7.68	3.91						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	6/12/02	6.35	6.35	3.97						< 3	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	3/7/02	3.24	3.33	4.06						< 3	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-73-D-1	0	Craig Hollow	1/14/02	3.35	4.26	4.06						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	12/11/01	13.2	16.1	4.07						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	2/19/02	2.65	2.65	4.11						< 3	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	7/19/01	2.38	2.77	4.19						34	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	11/14/01	11.6	15.2	4.21						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	4/30/02	1.84	2.17	4.52						5.2	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	10/17/01	9.56	11.8	4.53						< 5	Upper Kanawha	
WVK-73-D-1	0	Craig Hollow	4/4/02	1.9	2.09	4.63						7.2	Upper Kanawha	
WVK-73-E	0.4	Powellton Fork	12/6/01	0.0889	0.238	7.00						< 5	Upper Kanawha	
WVK-73-E	0.4	Powellton Fork	8/6/01	0.14	0.7	7.35						7	Upper Kanawha	
WVK-73-E	2.6	Powellton Fork	8/6/01	0.1	0.5	7.37						< 5	Upper Kanawha	
WVK-73-E	0.4	Powellton Fork	6/14/02	0.14	0.28	7.58						< 3	Upper Kanawha	
WVK-73-E	0.4	Powellton Fork	9/5/01	0.115	0.301	7.60						11	Upper Kanawha	
WVK-73-E.9	0	Laurel Branch/Armstrong Creek	9/24/01	0.158	0.188	6.48						< 5	Upper Kanawha	
WVK-73-E-2	0	Woodrum Branch	4/1/02	2.26	4.64	4.74						105	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	1/16/02	6.17	7.14	4.30						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	2/19/02	4.56	4.68	4.42						< 3	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	6/12/02	4.5	4.5	4.45						< 3	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	7/23/01	1.72	1.77	4.48						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	3/11/02	3.76	4.77	4.65						< 3	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	12/11/01	2.71	3.5	4.70						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	4/4/02	1.46	1.58	4.72						< 3	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	10/15/01	2.14	2.69	4.73						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	4/30/02	1.03	1.21	4.77						5.6	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	8/7/01	1.3	1.42	4.82						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	11/13/01	2.4	3	4.91						< 5	Upper Kanawha	
WVK-73-F	0	Right Fork/Armstrong Creek	9/24/01	2.21	2.55	5.07						< 5	Upper Kanawha	
WVK-73-G	0	Left Fork/Armstrong Creek	9/24/01	0.13	7.84	6.64						420	Upper Kanawha	
WVK-74	0.7	Boomer Branch	9/12/01	0.13	0.18	7.91						< 5	Upper Kanawha	
WVK-74	0.7	Boomer Branch	6/10/02	0.13	0.21	7.93						< 3	Upper Kanawha	
WVK-74	0.7	Boomer Branch	4/29/02	0.26	1.71	7.94						30.8	Upper Kanawha	
WVK-74	0.1	Boomer Branch	9/12/01	0.17	0.28	8.00						< 5	Upper Kanawha	
WVK-74	0.1	Boomer Branch	4/29/02	0.3	1.66	8.03						22	Upper Kanawha	
WVK-74	0.1	Boomer Branch	6/10/02	0.25	0.35	8.11						< 3	Upper Kanawha	
WVK-74	0.1	Boomer Branch	3/14/02	0.1	0.14	8.20						< 3	Upper Kanawha	
WVK-74	0.7	Boomer Branch	2/20/02	0.09	0.13	8.29						< 3	Upper Kanawha	
WVK-74	0.7	Boomer Branch	10/9/01	0.211	0.23	8.41						< 5	Upper Kanawha	
WVK-74	0.1	Boomer Branch	10/9/01	0.257	0.439	8.65						< 5	Upper Kanawha	
WVK-75	1.3	Jarrett Branch	10/9/01	0.153	0.163	6.72						< 5	Upper Kanawha	
WVK-75	0.3	Jarrett Branch	4/29/02	0.23	2.12	8.85						35.2	Upper Kanawha	
WVK-75	0.3	Jarrett Branch	10/9/01	0.092	0.159	9.84						24	Upper Kanawha	
WVK-75-A	0	UNT/Jarrett Branch RM 1.1	8/14/01	12.4	12.4	4.47						5	Upper Kanawha	
WVK-75-A	0	UNT/Jarrett Branch RM 1.1	6/10/02	5.85	6.45	4.61						< 3	Upper Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVK-75-A	0	UNT/Jarrett Branch RM 1.1	10/9/01	0.123	0.294	6.80						6	Upper Kanawha	
WVK-75-A	0	UNT/Jarrett Branch RM 1.1	9/12/01	0.13	0.6	8.20						25	Upper Kanawha	
WVK-76-C-1	0	Dempsey Branch	9/26/01	0.209	0.209	7.56						< 5	Upper Kanawha	
WVK-76-C-1-A	0	Coleman Branch	9/26/01	0.095	0.102	7.53						34	Upper Kanawha	
WVK-76-D	0	Beards Fork	3/6/02	0.1	0.15	7.38						< 3	Upper Kanawha	
WVK-76-D	0	Beards Fork	9/27/01	0.11	0.11	7.59						< 5	Upper Kanawha	
WVK-76-D	0	Beards Fork	6/11/02	0.14	0.18	8.44						< 3	Upper Kanawha	
WVK-76-J	0	Camp Branch	9/25/01	0.163	1.09	8.55						16	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	9/3/02	0.9	0.99	4.71						< 3	Upper Kanawha	69.25
WVK-76-K	0	Ingram Branch	8/8/01	0.77	1.12	4.96						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	9/3/02	0.36	0.39	5.17						< 3	Upper Kanawha	27.41
WVK-76-K	0.6	Ingram Branch	10/16/01	0.551	0.703	5.19						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	12/13/01	0.499	0.648	5.20						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	11/15/01	0.64	0.893	5.25						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	3/26/02	0.36	0.78	5.26						6	Upper Kanawha	
WVK-76-K	0	Ingram Branch	2/13/02	0.61	0.668	5.31						< 3	Upper Kanawha	
WVK-76-K	0	Ingram Branch	6/10/02	2.07	2.07	5.32						< 3	Upper Kanawha	
WVK-76-K	0	Ingram Branch	1/14/02	0.529	1.75	5.33						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	10/16/01	0.755	0.945	5.36						< 5	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	11/14/01	0.576	1.56	5.45						12	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	12/13/01	0.403	0.69	5.46						< 5	Upper Kanawha	
WVK-76-K	0	Ingram Branch	3/6/02	0.63	0.68	5.87						< 3	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	1/22/02	0.096	0.362	5.89						5.2	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	9/25/01	0.238	0.701	5.94						5	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	3/26/02	0.11	0.74	6.13						5.6	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	2/13/02	0.118	0.457	6.27						4	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	3/6/02	0.12	0.54	6.36						5.6	Upper Kanawha	
WVK-76-K	0	Ingram Branch	9/25/01	1.36	1.89	6.50						< 5	Upper Kanawha	
WVK-76-K	0.6	Ingram Branch	6/10/02	0.56	0.86	7.11						4.4	Upper Kanawha	
WVK-76-M	0	Open Fork	9/26/01	0.12	0.134	6.74						< 5	Upper Kanawha	
WVKC-10-H	0.3	Little Hewitt Creek	4/28/03	0.1	1.31	5.68						44	Coal	
WVKC-10-H	0.3	Little Hewitt Creek	3/13/03	0.22	0.26	5.73						< 3	Coal	
WVKC-10-H	0.3	Little Hewitt Creek	4/15/03	0.16	0.24	5.91						< 3	Coal	
WVKC-10-I-8	0	Rich Hollow	10/16/02	0.22	0.5	8.72						13	Coal	
WVKC-10-J	2.5	Little Horse Creek	2/4/03	0.27	0.32	7.29						6	Coal	
WVKC-10-T	4.6	Spruce Fork	3/19/03	0.12	0.19	7.18						< 3	Coal	
WVKC-10-T	18.1	Spruce Fork	3/17/03	0.1	0.34	7.59						< 3	Coal	
WVKC-10-T	4.6	Spruce Fork	4/17/03	0.1	0.19	8.00						< 3	Coal	
WVKC-10-T	0.3	Spruce Fork	3/18/03	0.11	0.19	8.19						< 3	Coal	
WVKC-10-T	4.6	Spruce Fork	8/28/02	0.15	0.18	8.27						< 3	Coal	
WVKC-10-T	0.3	Spruce Fork	8/31/02	0.1	0.11	8.28						< 3	Coal	
WVKC-10-T	0.3	Spruce Fork	8/31/02	0.09	0.1							3.6	Coal	
WVKC-10-T-11	3.5	Spruce Laurel Fork	3/19/03	0.11	0.16	7.78						< 3	Coal	

AMD Code	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKC-10-T-11	3.5	Spruce Laurel Fork	10/30/02	0.09	0.8	7.94						44	Coal	
WVKC-10-T-11	0.2	Spruce Laurel Fork	6/2/03	0.09	0.26	8.22						<3	Coal	
WVKC-10-T-11	3.5	Spruce Laurel Fork	4/16/03	0.11	0.47	8.26						5.6	Coal	
WVKC-10-T-11	3.5	Spruce Laurel Fork	12/9/02	0.09	0.24	8.38						6	Coal	
WVKC-10-T-11	0.2	Spruce Laurel Fork	4/16/03	0.1	0.28	8.38						5.2	Coal	
WVKC-10-T-11	0.2	Spruce Laurel Fork	6/2/03	0.09	0.27							8	Coal	
WVKC-10-T-22.5	0	Little White Oak Branch	2/24/03	0.12	0.21	8.66						4	Coal	
WVKC-10-T-25	0	Laurel Fork	8/26/02	0.25	1.27	5.71						13	Coal	
WVKC-10-T-5	0.1	Hunters Branch	4/17/03	0.57	1.16	5.19						5	Coal	
WVKC-10-T-5	0.1	Hunters Branch	2/26/03	1	1.15	5.42						6	Coal	
WVKC-10-T-5	0.1	Hunters Branch	1/30/03	0.37	0.88	6.57						6	Coal	
WVKC-10-T-5	0.1	Hunters Branch	3/19/03	0.28	1	6.94						5.6	Coal	
WVKC-10-T-9	0	Hewett Creek	8/28/02	2.46	9.86	5.24						56.8	Coal	
WVKC-10-T-9	0	Hewett Creek	7/16/02	0.24	0.42	7.94						<3	Coal	
WVKC-10-T-9	0	Hewett Creek	8/28/02	2.49	9.67							60.8	Coal	
WVKC-10-T-9-B	0	Missouri Fork	10/8/02	0.09	0.1	8.37						<3	Coal	
WVKC-10-U	0.3	Pond Fork	4/18/03	0.09	0.21	7.87						<3	Coal	
WVKC-10-U	32.3	Pond Fork	7/8/02	0.09	0.52	7.89						5.2	Coal	
WVKC-10-U	6.3	Pond Fork	5/8/03	0.09	0.11	8.03						<3	Coal	
WVKC-10-U	15.8	Pond Fork	3/18/03	0.16	1.52	8.04						4.4	Coal	
WVKC-10-U	6.3	Pond Fork	4/18/03	0.11	0.29	8.05						4	Coal	
WVKC-10-U	6.3	Pond Fork	11/20/02	0.12	0.22	8.16						4	Coal	
WVKC-10-U	0.3	Pond Fork	11/4/02	0.11	0.14	8.26						<3	Coal	
WVKC-10-U	6.3	Pond Fork	3/17/03	0.13	0.19	8.37						<3	Coal	
WVKC-10-U	0.3	Pond Fork	3/18/03	0.12	0.17	8.37						<3	Coal	
WVKC-10-U	6.3	Pond Fork	8/31/02	0.09	0.1	8.44						<3	Coal	
WVKC-10-U-12	0	Cow Creek	2/14/03	0.1	0.65	8.35						24	Coal	
WVKC-10-U-21	0	Lacey Branch	10/16/02	0.17	0.99	7.61						186	Coal	
WVKC-10-U-3	0	Robinson Creek	5/8/03	0.09	0.26	7.57						<3	Coal	
WVKC-10-U-3	0	Robinson Creek	4/18/03	0.09	0.49	7.70						8	Coal	
WVKC-10-U-3	0	Robinson Creek	7/17/02	0.12	0.13	8.11						<3	Coal	
WVKC-10-U-3	0	Robinson Creek	8/31/02	0.22	0.23	8.37						4	Coal	
WVKC-10-U-7	0.5	West Fork	5/9/03	0.14	0.19	8.26						<3	Coal	
WVKC-10-U-7	0.5	West Fork	3/17/03	0.18	0.47	8.32						4.8	Coal	
WVKC-10-U-7	0.5	West Fork	7/9/02	0.13	0.17	8.33						<3	Coal	
WVKC-10-U-7	0.5	West Fork	4/19/03	0.24	0.37	8.47						<3	Coal	
WVKC-10-U-7	0.5	West Fork	8/31/02	0.15	0.17	8.50						3.2	Coal	
WVKC-10-U-7-A	0	Roach Branch	10/16/02	0.11	0.73	7.32						79	Coal	
WVKC-10-U-7-D	0	Browns Branch	4/20/03	1.68	2.49	4.89						3	Coal	
WVKC-10-U-7-D-{0.2}-Discharge		Mine Discharge into Browns Branch	4/20/03	2.36	3.06	4.74						<3	Coal	
WVKC-31	4.9	Laurel Creek	5/28/03	0.1	0.4	7.78						6	Coal	
WVKC-31	4.9	Laurel Creek	7/30/02	0.14	0.22	7.85						<3	Coal	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKC-32	0	Horse Branch	10/9/02	6.78	6.78	3.96					<	3	Coal	
WVKC-32	0	Horse Branch	8/26/02	7.02	7.02	4.20						10	Coal	
WVKC-32	0	Horse Branch	11/14/02	2.58	2.58	4.25					<	3	Coal	
WVKC-32	0	Horse Branch	3/30/03	3.77	3.88	4.35					<	3	Coal	
WVKC-32	0	Horse Branch	10/30/02	2.64	2.7	4.57						4	Coal	
WVKC-32	0	Horse Branch	3/19/03	2.98	4.53	4.75						5.2	Coal	
WVKC-32	0	Horse Branch	7/30/02	2.84	3.44	4.85						8	Coal	
WVKC-32	0	Horse Branch	12/17/02	3.06	3.19	4.88						8	Coal	
WVKC-32	0	Horse Branch	5/29/03	2.28	2.86	5.01						3	Coal	
WVKC-32	0	Horse Branch	1/29/03	2.9	4.59	5.04						75	Coal	
WVKC-32	0	Horse Branch	3/3/03	1.49	1.78	5.31					<	3	Coal	
WVKC-33	0	Haggle Branch	3/19/03	0.44	0.51	5.27						5.2	Coal	
WVKC-33	0	Haggle Branch	3/3/03	0.5	0.5	5.45					<	3	Coal	
WVKC-33	0	Haggle Branch	3/30/03	0.32	0.39	5.45					<	3	Coal	
WVKC-33	0	Haggle Branch	12/17/02	0.31	0.45	5.55						5	Coal	
WVKC-33	0	Haggle Branch	11/14/02	0.1	0.11	5.67					<	3	Coal	
WVKC-33	0	Haggle Branch	5/29/03	0.1	0.27	5.79					<	3	Coal	
WVKC-33	0	Haggle Branch	1/29/03	0.31	0.52	5.96						7	Coal	
WVKC-35	2.7	White Oak Creek	10/29/02	0.1	22	7.52						1320	Coal	
WVKC-35	2.7	White Oak Creek	11/13/02	0.09	0.14	7.63						4	Coal	
WVKC-35	2.7	White Oak Creek	3/3/03	0.09	0.8	7.69						30	Coal	
WVKC-35	0.1	White Oak Creek	10/29/02	0.09	3.88	7.74						275	Coal	
WVKC-35	2.7	White Oak Creek	12/20/02	0.09	0.21	7.76					<	3	Coal	
WVKC-35	2.7	White Oak Creek	10/9/02	0.1	0.1	7.79					<	3	Coal	
WVKC-35	2.7	White Oak Creek	7/24/02	0.11	0.14	7.81					<	3	Coal	
WVKC-35	2.7	White Oak Creek	8/26/02	0.1	0.12	7.82					<	5	Coal	
WVKC-35	0.1	White Oak Creek	5/29/03	0.1	0.81	7.87						30	Coal	
WVKC-35	0.1	White Oak Creek	3/19/03	0.11	0.18	7.89					<	3	Coal	
WVKC-35	2.7	White Oak Creek	5/29/03	0.12	0.79	7.89						23	Coal	
WVKC-35	2.7	White Oak Creek	1/29/03	0.11	0.28	7.95						3	Coal	
WVKC-35	2.7	White Oak Creek	3/19/03	0.16	0.27	7.98						3.6	Coal	
WVKC-35	2.7	White Oak Creek	3/30/03	0.11	0.24	8.05						4	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	3/19/03	12.1	12.2	3.98					<	3	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	7/23/02	6.79	6.79	4.03						10.4	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	5/29/03	8.42	8.53	4.15						6	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	3/3/03	7.36	7.4	4.17						8	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	11/14/02	4.98	4.98	4.19					<	3	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	3/30/03	12.8	12.8	4.30					<	3	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	12/17/02	4.25	4.25	4.47						30	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	10/30/02	6.6	6.61	4.49					<	3	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	3/19/03	5.09	7.17	4.71						14.4	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	1/28/03	8.99	8.99	4.72					<	3	Coal	
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	10/9/02	1.12	1.12	4.85					<	3	Coal	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKC-35.8	0.5	UNT/Big Coal River RM 52.7	8/26/02	1.35	1.48	4.87						7	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	3/3/03	3.06	3.18	5.13						6	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	1/28/03	3.63	7.47	5.26						18	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	5/28/03	0.81	3.69	5.32						37	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	3/30/03	5.55	7.94	5.35						16	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	11/14/02	0.38	2.56	5.36						10	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	12/17/02	0.81	1.83	5.51						6	Coal	
WVKC-35.8	0	UNT/Big Coal River RM 52.7	7/22/02	0.09	3.36	7.36						12	Coal	
WVKC-35-D	0	Threemile Branch	3/19/03	0.52	0.53	4.65						<3	Coal	
WVKC-35-E	0	Left Fork/White Oak Creek	3/3/03	0.1	0.47	8.09						21	Coal	
WVKC-35-E	0	Left Fork/White Oak Creek	5/29/03	0.11	0.21	8.10						<3	Coal	
WVKC-35-E	0	Left Fork/White Oak Creek	3/19/03	0.15	0.36	8.16						5.2	Coal	
WVKC-35-E	0	Left Fork/White Oak Creek	3/30/03	0.1	0.33	8.22						5	Coal	
WVKC-39	0	Little Elk Creek	5/14/03	0.1	0.25	8.07						<3	Coal	
WVKC-39	0	Little Elk Creek	9/5/02	0.1	0.72	8.08						<3	Coal	
WVKC-46	32	Marsh Fork	10/9/02	0.088	0.148	7.82						3	Coal	
WVKC-46-A	0.7	Little Marsh Fork	11/25/02	0.14	1.16	7.77						13	Coal	
WVKC-46-A	0.7	Little Marsh Fork	11/4/02	0.1	0.58	7.81						13	Coal	
WVKC-46-A	0.7	Little Marsh Fork	10/15/02	0.19	0.55	7.96						7	Coal	
WVKC-46-A	0.7	Little Marsh Fork	12/23/02	0.09	0.22	8.02						4	Coal	
WVKC-46-A	0.7	Little Marsh Fork	1/21/03	0.1	0.58	8.07						6	Coal	
WVKC-46-A	0.7	Little Marsh Fork	4/17/03	0.09	0.33	8.12						8	Coal	
WVKC-46-A	0.7	Little Marsh Fork	5/12/03	0.16	0.55	8.18						15	Coal	
WVKC-46-A	0.7	Little Marsh Fork	3/17/03	0.16	1.03	8.21						36.4	Coal	
WVKC-46-A	0.7	Little Marsh Fork	8/27/02	0.19	0.21	8.21						<5	Coal	
WVKC-46-A	0.7	Little Marsh Fork	7/24/02	0.22	0.44	8.26						8	Coal	
WVKC-46-A-4	0	Brushy Fork	11/26/02	0.1	1.55	7.57						22	Coal	
WVKC-46-A-4	0	Brushy Fork	11/4/02	0.1	1.11	7.64						16	Coal	
WVKC-46-A-4	0	Brushy Fork	3/18/03	0.11	1.68	7.78						24	Coal	
WVKC-46-A-4	0	Brushy Fork	5/12/03	0.18	0.96	7.95						19	Coal	
WVKC-46-A-4	0	Brushy Fork	4/16/03	0.21	0.97	8.03						22	Coal	
WVKC-46-A-4	0	Brushy Fork	7/24/02	0.29	1.1	8.05						17.2	Coal	
WVKC-46-A-4	0	Brushy Fork	12/23/02	0.15	2.9	8.07						<3	Coal	
WVKC-46-A-4	0	Brushy Fork	10/15/02	0.11	0.92	8.10						18	Coal	
WVKC-46-A-4	0	Brushy Fork	8/27/02	0.15	0.49	8.12						8.8	Coal	
WVKC-46-D	0	Shumate Creek	2/24/03	1.51	1.51	7.46						36	Coal	
WVKC-46-G-2	2.6	Martin Fork	4/16/03	2.15	3.1	4.92						3.6	Coal	
WVKC-46-G-2	2.6	Martin Fork	12/30/02	1.84	3.43	5.29						8	Coal	
WVKC-46-G-3	0	Millers Fork	3/20/03	0.76	0.76	7.07						34	Coal	
WVKC-46-J-2	0.7	Bee Branch	7/25/02	2.6	2.84	4.62						<3	Coal	
WVKC-46-J-2	0.7	Bee Branch	9/3/02	1.2	1.2	4.64						4	Coal	
WVKC-46-J-2	0.7	Bee Branch	5/29/03	1.36	1.77	5.01						6	Coal	
WVKC-46-N	0.1	Maple Meadow Creek	10/9/02	0.089	0.09	7.33						4	Coal	

ANcode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKC-46-Q	5	Miller Camp Branch	10/10/02	0.757	2.2	5.91						10	Coal	
WVKC-46-Q	4.2	Miller Camp Branch	10/10/02	0.106	0.129	7.13						10	Coal	
WVKC-46-Q	4.2	Miller Camp Branch	1/15/03	0.1	0.1	7.34						<3	Coal	
WVKC-46-Q	4.2	Miller Camp Branch	5/8/03	0.3	0.18	7.36						3	Coal	
WVKC-46-Q	1	Miller Camp Branch	8/13/02	0.153	0.313	7.76						4	Coal	
WVKC-46-Q	0	Miller Camp Branch	10/22/02	0.104	0.198	7.81						2	Coal	
WVKC-46-Q	0	Miller Camp Branch	9/5/02	0.1	0.21	7.84						<5	Coal	
WVKC-46-Q	0	Miller Camp Branch	9/25/02	0.1	0.202	7.85						5	Coal	
WVKC-47	7.2	Clear Fork	10/17/02	0.09	0.55	7.21						24	Coal	
WVKC-47	7.2	Clear Fork	11/14/02	0.09	0.3	7.69						5	Coal	
WVKC-47	4.1	Clear Fork	7/15/02	0.12	0.48	7.74						13.2	Coal	
WVKC-47	7.2	Clear Fork	3/24/03	0.1	0.38	7.84						<3	Coal	
WVKC-47	2.4	Clear Fork	7/15/02	0.1	0.52	7.90						18	Coal	
WVKC-47	7.2	Clear Fork	7/10/02	0.26	0.29	7.91						<3	Coal	
WVKC-47	0	Clear Fork	7/15/02	0.09	0.74	7.95						19.2	Coal	
WVKC-47	7.2	Clear Fork	5/13/03	0.16	0.26	8.06						<3	Coal	
WVKC-47	4.1	Clear Fork	5/13/03	0.1	0.17	8.08						<3	Coal	
WVKC-47	7.2	Clear Fork	9/4/02	0.2	0.24	8.16						<5	Coal	
WVKC-47-F	0	Stonecoal Branch	2/25/03	6.6	6.6	4.59						10	Coal	
WVKC-47-F	0	Stonecoal Branch	3/24/03	6.12	6.12	4.64						<3	Coal	
WVKC-47-F	0	Stonecoal Branch	4/16/03	6.33	6.33	4.65						4	Coal	
WVKC-47-F	0	Stonecoal Branch	5/13/03	5.63	5.75	4.74						10	Coal	
WVKC-47-F	0	Stonecoal Branch	7/10/02	1.46	6.09	4.77						170	Coal	
WVKC-47-F	0	Stonecoal Branch	9/4/02	1.01	1.85	4.77						38	Coal	
WVKC-47-F	0	Stonecoal Branch	1/30/03	6.09	6.09	4.88						6	Coal	
WVKC-47-F	0	Stonecoal Branch	10/29/02	2.6	4.39	4.94						65	Coal	
WVKC-47-F	0	Stonecoal Branch	10/17/02	3.34	3.71	5.01						14	Coal	
WVKC-47-F	0	Stonecoal Branch	11/14/02	1.53	2.4	5.14						7	Coal	
WVKC-47-F	0	Stonecoal Branch	12/10/02	0.34	8.39	5.30						382	Coal	
WVKC-47-G	0.5	Long Branch	10/17/02	0.1	0.68	6.32						5	Coal	
WVKC-47-G	0.5	Long Branch	10/30/02	0.11	0.5	6.66						5	Coal	
WVKC-47-G	0.5	Long Branch	1/29/03	0.11	0.78	7.26						6	Coal	
WVKC-47-G	0.5	Long Branch	9/4/02	0.13	1.14	7.27						7.2	Coal	
WVKC-47-G	0.5	Long Branch	7/10/02	0.15	1.22	7.31						3.2	Coal	
WVKC-47-G	0.5	Long Branch	5/13/03	0.1	0.64	7.36						3	Coal	
WVKC-47-G	0.5	Long Branch	4/2/03	0.1	0.68	7.42						8	Coal	
WVKC-47-G	0.5	Long Branch	12/10/02	0.09	0.46	7.45						<3	Coal	
WVKC-47-G-1	0	Dow Fork	2/25/03	13	13	3.55						14	Coal	
WVKC-47-G-1	0	Dow Fork	1/29/03	10.4	10.6	3.79						<3	Coal	
WVKC-47-G-1	0	Dow Fork	4/15/03	8.92	9	3.84						3.6	Coal	
WVKC-47-G-1	0	Dow Fork	7/10/02	13	13	3.94						<3	Coal	
WVKC-47-G-1	0	Dow Fork	9/4/02	9.68	9.68	4.00						<5	Coal	
WVKC-47-G-1	0	Dow Fork	4/2/03	10.6	10.8	4.03						<3	Coal	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKC-47-G-1	0	Dow Fork	5/13/03	10	10.1	4.09						< 3	Coal	
WVKC-47-G-1	0	Dow Fork	12/10/02	7.55	7.55	4.17						< 3	Coal	
WVKC-47-G-1	0	Dow Fork	10/17/02	9.2	9.2	4.36						< 3	Coal	
WVKC-47-G-1	0	Dow Fork	11/13/02	5.19	5.19	4.41						< 3	Coal	
WVKC-47-G-1	0	Dow Fork	10/30/02	5.8	5.8	4.48						< 3	Coal	
WVKE	89.5	Elk River	12/3/02	0.21	0.28	6.40						< 3	Elk	
WVKE	107	Elk River	12/3/02	0.1	0.18	6.64						< 3	Elk	
WVKE	27.2	Elk River	5/12/03	0.15	0.85	6.94						100	Elk	
WVKE	56.3	Elk River	4/4/03	0.15	0.22	7.06						3	Elk	
WVKE	4.4	Elk River	5/12/03	0.16	1.25	7.11						225	Elk	
WVKE	27.2	Elk River	4/4/03	0.19	0.25	7.16						< 3	Elk	
WVKE	107	Elk River	1/6/03	0.12	0.32	7.22						3	Elk	
WVKE	27.2	Elk River	1/9/03	0.12	0.2	7.27						< 3	Elk	
WVKE	4.4	Elk River	1/6/03	0.12	0.16	7.27						< 3	Elk	
WVKE	4.4	Elk River	12/6/02	0.11	0.15	7.40						< 3	Elk	
WVKE	27.2	Elk River	2/11/03	0.11	0.23	7.42						< 3	Elk	
WVKE	27.2	Elk River	3/6/03	0.16	0.23	7.45						< 3	Elk	
WVKE	89.5	Elk River	1/6/03	0.14	0.29	7.45						11	Elk	
WVKE	56.3	Elk River	6/5/03	0.18	0.29	7.47						16	Elk	
WVKE	27.2	Elk River	6/5/03	0.21	0.48	7.49						< 3	Elk	
WVKE	56.3	Elk River	2/11/03	0.14	0.16	7.57						< 3	Elk	
WVKE	56.3	Elk River	3/6/03	0.16	0.19	7.60						< 3	Elk	
WVKE	89.5	Elk River	4/2/03	0.22	0.26	7.66						11	Elk	
WVKE	107	Elk River	6/4/03	0.12	0.22	7.70						43	Elk	
WVKE	4.4	Elk River	2/20/03	0.14	0.57	7.72						< 3	Elk	
WVKE	107	Elk River	4/2/03	0.25	0.29	7.73						< 3	Elk	
WVKE	107	Elk River	2/10/03	0.15	0.31	7.83						360	Elk	
WVKE-23	0.9	Big Sandy Creek	2/17/01	0.1	4.74	6.50						22	Elk	
WVKE-23	0.9	Big Sandy Creek	5/12/03	0.15	0.36	6.65						110	Elk	
WVKE-23	0.9	Big Sandy Creek	4/18/00	0.144	2.52	6.90						< 3	Elk	
WVKE-23	0.9	Big Sandy Creek	2/11/03	0.25	0.3	7.27						< 3	Elk	
WVKE-23	0.9	Big Sandy Creek	1/9/03	0.11	0.16	7.28						< 3	Elk	
WVKE-23	0.9	Big Sandy Creek	4/4/03	0.16	0.28	7.31						3	Elk	
WVKE-23	0.9	Big Sandy Creek	12/6/02	0.14	0.15	7.35						< 3	Elk	
WVKE-23	0.9	Big Sandy Creek	3/6/03	0.14	0.19	7.40						9	Elk	
WVKE-23	0.9	Big Sandy Creek	6/5/03	0.11	0.46	7.48						260	Elk	
WVKE-23	0.9	Big Sandy Creek	4/4/00	0.122	3.94	7.60						17	Elk	
WVKE-26	0.7	Morris Creek	4/4/00	0.117	0.662	6.70						5	Elk	
WVKE-26	0.7	Morris Creek	4/18/00	0.118	0.4	7.00						4	Elk	
WVKE-26-A	0	Left Fork/Morris Creek	4/10/01	1.42	1.72	4.86						4	Elk	
WVKE-50	15.2	Buffalo Creek	5/7/01	0.391	0.838	4.85						16	Elk	
WVKE-50	15.2	Buffalo Creek	4/11/01	0.368	1.23	5.33						3	Elk	
WVKE-50	0.7	Buffalo Creek	4/4/03	0.17	0.52	6.75								

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKE-50	0.7	Buffalo Creek	1/9/03	0.16	0.44	6.87						5	Elk	
WVKE-50	0.7	Buffalo Creek	6/5/03	0.1	0.47	7.46						< 3	Elk	
WVKE-50	0.7	Buffalo Creek	2/11/03	0.26	0.31	7.73						< 3	Elk	
WVKE-50-P		Taylor Creek	5/7/01	1.9	1.89	4.14						2	Elk	
WVKE-50-P		Taylor Creek	4/11/01	1.28	1.46	4.46						5	Elk	
WVKE-50-R		Spanish Oak Branch	5/7/01	0.34	0.389	4.31						4	Elk	
WVKE-50-R		Spanish Oak Branch	4/11/01	0.407	0.417	4.59						< 1	Elk	
WVKE-50-S		Dille Run	5/7/01	2.95	2.99	3.88						2	Elk	
WVKE-50-S		Dille Run	4/11/01	1.24	1.28	4.44						2	Elk	
WVKE-50-T.3		2nd UNT/Buffalo Creek	4/11/01	0.878	0.918	5.04						4	Elk	
WVKE-50-T.3		2nd UNT/Buffalo Creek	5/7/01	0.293	0.618	5.50						4	Elk	
WVKE-50-T.5		3rd UNT/Buffalo Creek	5/7/01	0.897	0.93	4.89						2	Elk	
WVKE-50-T.5		3rd UNT/Buffalo Creek	4/11/01	1.06	1.08	4.91						1	Elk	
WVKE-50-U		Brushy Fence Run	5/7/01	1.67	1.84	4.84						1	Elk	
WVKE-50-U		Brushy Fence Run	4/11/01	1.26	1.86	4.89						4	Elk	
WVKE-76	11.9	Birch River	12/3/02	0.19	0.31	6.60						< 3	Elk	
WVKE-76	11.9	Birch River	2/10/03	0.18	0.18	7.22						< 3	Elk	
WVKE-76	11.9	Birch River	4/2/03	0.26	0.29	7.52						< 3	Elk	
WVKE-76	11.9	Birch River	5/6/03	0.3	0.31	7.60						< 3	Elk	
WVKE-9	0.7	Little Sandy Creek	4/18/00	0.128	3.28	7.20						140	Elk	
WVKE-9	0.7	Little Sandy Creek	4/4/00	0.118	3.89	8.20						230	Elk	
WVKE-9-B	0.1	Wills Creek	4/18/00	0.117	2.1	7.00						97	Elk	
WVKE-9-B	0.1	Wills Creek	4/4/00	0.102	1.99	7.50						100	Elk	
WVKG-13-G	0	Jones Branch	9/3/03	0.09	2.52	7.64						64	Gauley	
WVKG-13-O	0	Bryant Branch	3/31/04	0.09	15.9	7.63						528	Gauley	
WVKG-19-U-2-A	0	Briery Creek	9/3/03	1.22	1.28	4.84						< 3	Gauley	
WVKG-19-U-2-A	0	Briery Creek	1/13/04	0.41	0.79	5.02						< 3	Gauley	
WVKG-19-U-2-A	0	Briery Creek	11/4/03	0.34	0.8	5.19						< 3	Gauley	
WVKG-19-U-2-A	0	Briery Creek	10/21/03	0.22	0.64	5.41						< 3	Gauley	
WVKG-19-U-2-A	0	Briery Creek	7/16/03	0.18	0.82	5.55						9	Gauley	
WVKG-19-V-3.8	0	UNT/Little Clear Creek RM 7.5	9/3/03	0.12	0.81	7.42						5	Gauley	
WVKG-19-V-4	0	Cutlip Branch	9/24/03	0.09	2.59	7.64						23	Gauley	
WVKG-26-B	0.2	Glade Creek	11/12/03	0.1	7.94	6.40						265	Gauley	
WVKG-26-K-1	0.1	Lower Spruce Run	2/18/04	0.4	1.42	5.80						19	Gauley	
WVKG-26-K-1	0.1	Lower Spruce Run	1/21/04	0.15	0.23	6.05						< 3	Gauley	
WVKG-26-K-1	0.1	Lower Spruce Run	3/2/04	0.27	0.72	6.61						18	Gauley	
WVKG-26-K-1-A	0	Spruce Run	3/15/04	0.49	0.93	5.22						4	Gauley	
WVKG-26-K-1-A	0	Spruce Run	2/18/04	1.47	2.18	6.11						20	Gauley	
WVKG-26-K-1-A	0	Spruce Run	3/2/04	1.28	1.44	6.14						< 3	Gauley	
WVKG-26-K-1-A	0	Spruce Run	1/21/04	0.51	0.82	6.84						4	Gauley	
WVKG-30	14.1	Big Beaver Creek	10/24/03	0.18	0.19	6.98						< 2.39	Gauley	
WVKG-30	4.6	Big Beaver Creek	10/23/03	0.14	0.25	7.30						< 2.39	Gauley	
WVKG-30	6.3	Big Beaver Creek	10/14/03	0.23	0.23	7.41						< 2.39	Gauley	

AN Code	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKG-30-D	0.8	Wyatt Run	10/23/03	0.13	0.17	7.66					<	2.39	Gauley	
WVKG-30-E	2.9	Little Beaver Creek	10/14/03	0.22	0.27	6.88						3	Gauley	
WVKG-30-E	4	Little Beaver Creek	10/14/03	0.24	0.27	7.38						4	Gauley	
WVKG-30-E	0.4	Little Beaver Creek	10/14/03	0.13	0.25	7.48						6	Gauley	
WVKG-30-E-4	0	UNT/Little Beaver Creek RM 4.0	10/14/03	0.26	0.28	7.37						3	Gauley	
WVKG-30-L	0.3	Bearpen Fork	1/14/04	0.83	2.38	5.74						18	Gauley	
WVKG-30-L	0.3	Bearpen Fork	2/12/04	0.16	1.36	5.90						18	Gauley	
WVKG-30-L	0.3	Bearpen Fork	12/18/03	0.1	0.54	6.02						3	Gauley	
WVKG-30-L	0.3	Bearpen Fork	4/6/04	0.12	0.52	6.21						4	Gauley	
WVKG-30-L	0.3	Bearpen Fork	10/24/03	0.25	1.08	6.43						7	Gauley	
WVKG-30-L	1.1	Bearpen Fork	2/12/04	0.09	0.58	6.47						12	Gauley	
WVKG-30-N	0	Lower Laurel Run	10/24/03	0.2	0.22	6.76					<	2.39	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	11/12/03	0.11	0.8	4.82						18	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	12/15/03	0.18	0.23	5.03					<	3	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	4/6/04	0.2	0.3	5.42					<	3	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	3/8/04	0.15	0.36	5.73					<	3	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	10/24/03	0.22	0.24	6.21						4	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	2/12/04	0.18	0.2	6.28					<	3	Gauley	
WVKG-30-P	0.1	Upper Laurel Run	1/14/04	0.12	0.3	6.84						8	Gauley	
WVKG-30-Q	0.1	Board Fork	10/24/03	0.18	0.22	6.67					<	2.39	Gauley	
WVKG-31	0	Little Laurel Creek	7/22/03	0.13	0.36	7.44						3	Gauley	
WVKG-31	0	Little Laurel Creek	10/14/03	0.1	0.49	7.67					<	3	Gauley	
WVKG-31	0	Little Laurel Creek	10/1/03	0.09	0.3	7.67					<	3	Gauley	
WVKG-32	3.4	Panther Creek	9/5/03	0.2	0.29	6.17						8	Gauley	
WVKG-32	0	Panther Creek	7/22/03	0.09	0.43	7.16						3	Gauley	
WVKG-32	0	Panther Creek	10/1/03	0.1	0.4	7.64					<	3	Gauley	
WVKG-34-H-11.5	0	Carpenter Run	7/22/03	0.36	0.36	4.24						3	Gauley	
WVKG-34-H-11.5	0	Carpenter Run	4/7/04	0.49	0.52	4.59					<	3	Gauley	
WVKG-34-H-8	0	Windy Run	7/22/03	0.27	0.29	4.45					<	3	Gauley	
WVKG-34-H-8	0	Windy Run	9/9/03	0.28	0.29	4.47					<	3	Gauley	
WVKG-34-H-9	0	Armstrong Run	7/22/03	0.3	0.34	4.40						4	Gauley	
WVKG-5-B-1	0	Open Fork	12/29/03	0.5	1.32	5.01					<	3	Gauley	
WVKG-5-B-1	0	Open Fork	2/19/04	0.95	1.58	5.22						3	Gauley	
WVKG-5-B-1	0	Open Fork	1/28/04	1.04	1.68	5.42						4	Gauley	
WVKG-5-B-1	0	Open Fork	3/18/04	0.45	1.12	5.51						4	Gauley	
WVKG-5-B-1	0	Open Fork	3/30/04	0.18	0.93	5.76						3	Gauley	
WVKG-5-B-1	0	Open Fork	9/29/03	0.1	1.28	5.97						6	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	12/29/03	7	7	4.23					<	3	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	2/27/04	11	11	4.32						4	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	7/16/03	9.15	9.15	4.33					<	3	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	9/29/03	9.7	9.7	4.42					<	3	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	10/27/03	9.08	9.35	4.43						10	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	1/28/04	8	8	4.50					<	3	Gauley	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKG-5-B-1-C	0	Sangamore Fork	3/19/04	5.8	6.17	4.58					<	3	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	11/11/03	6	6	4.64					<	3	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	9/2/03	3.42	4.69	4.72						32	Gauley	
WVKG-5-B-1-C	0	Sangamore Fork	4/2/04	2.28	3	5.15						16	Gauley	
WVKG-5-F	0	Rockcamp Fork	12/23/03	0.95	1.25	4.75						7	Gauley	
WVKG-5-F	0	Rockcamp Fork	2/26/04	1.92	2.08	4.81					<	3	Gauley	
WVKG-5-F	0	Rockcamp Fork	7/17/03	0.97	1.07	4.96					<	3	Gauley	
WVKG-5-F	0	Rockcamp Fork	10/28/03	1.04	1.19	4.97					<	3	Gauley	
WVKG-5-F	0	Rockcamp Fork	10/1/03	1.79	1.82	5.10					<	3	Gauley	
WVKG-5-F	0	Rockcamp Fork	11/11/03	0.22	0.6	5.19						3	Gauley	
WVKG-5-F	0	Rockcamp Fork	3/18/04	0.57	0.83	5.28						3	Gauley	
WVKG-5-F	0	Rockcamp Fork	2/2/04	0.9	1.19	5.29						4	Gauley	
WVKG-5-F	0	Rockcamp Fork	4/2/04	0.16	0.64	5.62						13	Gauley	
WVKG-5-F-1	0	Spring Branch	10/29/03	11.2	11.5	3.29					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	12/23/03	8	8	3.30					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	2/27/04	12.4	12.4	3.32					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	7/17/03	11.8	11.7	3.36						3	Gauley	
WVKG-5-F-1	0	Spring Branch	11/11/03	6	6	3.40					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	10/1/03	14.2	13.4	3.44					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	3/18/04	6.43	6.66	3.44					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	9/3/03	3.95	3.8	3.57					<	3	Gauley	
WVKG-5-F-1	0	Spring Branch	4/2/04	2.79	2.95	3.79						4	Gauley	
WVKN-22	14.9	Dunloup Creek	7/11/02	1.53	1.73	3.81						3.2	Lower New	
WVKN-22	14.1	Dunloup Creek	7/11/02	0.27	1.44	5.35						8.8	Lower New	
WVKN-22-{14.4}-Discharge		Dunloup Creek-Mine Discharge #2	7/11/02	12.6	12.6	3.53					<	3	Lower New	
WVKN-22-B	3.1	Meadow Fork	3/20/02	0.34	0.36	7.75						74	Lower New	
WVKN-22-B-1.3	0	UNT/Meadow Fork RM 0.7	1/17/02	5.44	7	3.40					<	5	Lower New	
WVKN-22-B-1.3	0	UNT/Meadow Fork RM 0.7	4/3/02	5.29	5.42	3.42					<	3	Lower New	
WVKN-22-B-1.3	0	UNT/Meadow Fork RM 0.7	3/21/02	0.74	0.98	3.67					<	3	Lower New	
WVKN-22-B-1.5	0.1	UNT/Meadow Fork RM 0.9	1/16/02	0.866	0.99	4.04					<	5	Lower New	
WVKN-22-B-1.5	0.1	UNT/Meadow Fork RM 0.9	4/3/02	1.29	1.42	4.58					<	3	Lower New	
WVKN-22-B-1.5	0.1	UNT/Meadow Fork RM 0.9	3/20/02	0.5	0.8	4.77						21.6	Lower New	
WVKN-22-B-3-{0.0}-Seep		Sleepy Hollow Mine Seep into UNT/Meadow Fork	4/3/02	0.27	0.34	5.29						9.2	Lower New	
WVKN-22-F	0	Smith Branch	4/3/02	0.63	0.77	5.37					<	3	Lower New	
WVKN-22-F	0	Smith Branch	3/13/02	0.11	0.96	6.43					<	3	Lower New	
WVKN-22-P	0	UNT/Dunloup Creek RM 14.1	7/11/02	1.67	1.67	3.59					<	3	Lower New	
WVKP-1	1.4	Helzer Creek	8/28/02	0.11	0.29	5.98					<	3	Lower Kanawha	
WVKP-1	1.8	Helzer Creek	8/28/02	0.12	0.28	6.22					<	3	Lower Kanawha	
WVKP-1-0.9A	0.1	UNT/Helzer Creek RM 0.6	2/27/03	5.94	6.08	4.08					<	3	Lower Kanawha	
WVKP-13	4	Tupper Creek	2/25/03	7.11	8.06	4.49						4	Lower Kanawha	
WVKP-13	5.8	Tupper Creek	2/25/03	5.3	6.11	4.75						28	Lower Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKP-13	1.3	Tupper Creek	2/25/03	0.22	3.01	6.65						28	Lower Kanawha	
WVKP-13	1.3	Tupper Creek	4/21/03	0.1	7.3	7.35						221	Lower Kanawha	
WVKP-13-A	0	Legg Fork	4/21/03	0.09	4.5	7.41						109	Lower Kanawha	
WVKP-13-C.5	0.1	Union Fork	2/26/03	14.1	14.7	3.77						32	Lower Kanawha	
WVKP-13-C.5	0.1	Union Fork	3/25/03	8.97	11.6	4.49						32	Lower Kanawha	
WVKP-13-C.5	0.1	Union Fork	4/24/03	0.18	5.43	5.97						33	Lower Kanawha	
WVKP-13-C.5	0.1	Union Fork	5/14/03	0.1	5.92	6.16						25	Lower Kanawha	
WVKP-13-C.5-1	0.2	UNT/Union Fork RM 0.2	2/25/03	15.6	15.6	3.57						28	Lower Kanawha	
WVKP-13-C.5-1	0.2	UNT/Union Fork RM 0.2	3/25/03	15.3	16.1	3.90						24	Lower Kanawha	
WVKP-13-C.5-1	0.2	UNT/Union Fork RM 0.2	5/14/03	4.98	9.35	4.86						27	Lower Kanawha	
WVKP-13-C.5-1	0.2	UNT/Union Fork RM 0.2	4/24/03	3.96	7.55	4.99						34	Lower Kanawha	
WVKP-1-A	1.1	Manila Creek	8/27/02	3.74	3.91	4.36					<	5	Lower Kanawha	
WVKP-1-A	0.8	Manila Creek	8/27/02	2.37	2.69	4.82					<	5	Lower Kanawha	
WVKP-1-A	1.1	Manila Creek	7/17/02	0.16	0.44	5.82					<	3	Lower Kanawha	
WVKP-1-A	0.8	Manila Creek	1/27/03	0.14	1.44	6.58						6	Lower Kanawha	
WVKP-1-A	1.1	Manila Creek	10/16/02	0.12	2.34	6.80						96	Lower Kanawha	
WVKP-1-A	0.8	Manila Creek	10/16/02	0.1	1.66	6.96						31	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	3/24/03	7.56	7.56	3.76						13	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	8/28/02	9.08	9.08	3.81					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	7/18/02	7.32	7.32	3.90					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	11/4/02	8.25	8.67	3.98					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	10/15/02	10.5	10.5	4.12					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	5/12/03	5.96	5.96	4.13					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	4/24/03	5.95	5.95	4.20					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	12/19/02	5.66	5.66	4.30					<	3	Lower Kanawha	
WVKP-1-A.3	0.1	Coal Hollow	11/18/02	4.21	4.21	4.52						13	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	1/31/03	5.93	5.93	3.32						13	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	12/19/02	4.06	4.06	3.34					<	3	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	3/24/03	5.06	5.06	3.44					<	3	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	5/12/03	5.93	5.93	3.62						10	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	4/23/03	4.88	4.88	3.69						8	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	6/12/03	5.5	5.82	3.83						15	Lower Kanawha	
WVKP-1-A.6	0	UNT/Heizer Creek RM 2.3	2/28/03	0.83	2.32	5.59						29	Lower Kanawha	
WVKP-1-A-{2.0}-Mine		Mine Drainage into Manila Creek	7/17/02	41.8	42.7	2.87						21.6	Lower Kanawha	
WVKP-1-A-{3.12}-Mine		Mine Discharge into Manila Creek	3/3/03	1.94	2.64	4.10						12	Lower Kanawha	
WVKP-1-A-0.2	0	UNT/Manila Creek RM 1.0	10/16/02	0.14	1.25	7.12						26	Lower Kanawha	
WVKP-1-A-0.3	0	Martins Branch	10/16/02	0.13	1.37	6.39						16	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	7/17/02	23.2	23.5	3.16					<	3	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	10/15/02	20.9	22.1	3.27						12	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	11/4/02	13.6	13.7	3.39					<	3	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	5/13/03	14.7	15.1	3.42						6	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	2/27/03	11.8	11.8	3.47						32	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	3/24/03	13	13	3.52						12	Lower Kanawha	

AMD Code	Mile Point	Stream Name	Date	Dis Al	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVKP-1-A-0.4	0	Sulphur Hollow	4/22/03	3.52	6.62	4.63						19	Lower Kanawha	
WVKP-1-A-0.4	0	Sulphur Hollow	11/20/02	0.31	3.58	5.51						17	Lower Kanawha	
WVKP-1-A-0.48	0	UNT/Manila Creek RM 2.3 (#4 Hollow)	1/27/03	2.97	3.95	3.74						16	Lower Kanawha	
WVKP-1-A-0.48	0	UNT/Manila Creek RM 2.3 (#4 Hollow)	5/12/03	3.32	4.34	4.08						51	Lower Kanawha	
WVKP-1-A-0.48	0	UNT/Manila Creek RM 2.3 (#4 Hollow)	3/24/03	0.52	3.15	5.53						26	Lower Kanawha	
WVKP-1-A-0.48	0	UNT/Manila Creek RM 2.3 (#4 Hollow)	11/20/02	0.13	1.14	6.03						12	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	11/5/02	6.19	6.19	3.99					<	3	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	10/15/02	8.75	8.75	4.05						3	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	5/12/03	4.89	4.93	4.58						5	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	4/24/03	3.72	5.16	4.86						14	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	2/27/03	1.83	4.97	5.23						24	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	3/24/03	0.53	4.2	5.40						16	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	12/20/02	0.1	0.34	7.14					<	3	Lower Kanawha	
WVKP-1-A-0.6	0	Alcocks Hollow	11/19/02	0.09	0.37	7.20					<	3	Lower Kanawha	
WVKP-1-A-0.7	0	UNT/Manila Creek RM 2.9	10/16/02	0.13	0.92	7.10						8	Lower Kanawha	
WVLK-31	20	Spring Creek	12/14/99	0.51	1.68	7.80						144	Little Kanawha	
WVLK-31	0	Spring Creek	12/14/99	0.41	4.02	8.10						375	Little Kanawha	
WVLK-31	7	Spring Creek	12/14/99	0.28	4.23	8.10						650	Little Kanawha	
WVLK-31-A		Bear Run	12/14/99	0.24	1.49	8.40						144	Little Kanawha	
WVLK-31-AA	4	Right Fork/Spring Creek	12/14/99	0.34	1.44	7.10						96	Little Kanawha	
WVLK-31-AA	0	Right Fork/Spring Creek	12/14/99	0.41	1.68	7.50						144	Little Kanawha	
WVLK-31-AA-1	2.6	Lick Fork	12/14/99	0.49	1.13	7.40						70	Little Kanawha	
WVLK-31-AA-1	0	Lick Fork	12/14/99	0.45	0.84	7.50						52	Little Kanawha	
WVLK-31-AA-3		Missouri Fork	12/14/99	0.11	1.81	7.50						206	Little Kanawha	
WVLK-31-H	0.2	Beaverdam Run	12/14/99	0.31	0.8	7.70						15	Little Kanawha	
WVLK-31-N		Toms Run	12/14/99	0.47	0.94	7.80						18	Little Kanawha	
WVLK-31-O	4.8	Little Spring Creek	12/14/99	0.54	1.95	7.70						180	Little Kanawha	
WVLK-31-O	0	Little Spring Creek	12/14/99	0.46	2.07	8.00						114	Little Kanawha	
WVLK-31-O-2		Left Fork/Little Spring Creek	12/14/99	0.94	1.52	7.60						68	Little Kanawha	
WVLK-31-O-6		Right Fork/Little Spring Creek	12/14/99	0.38	2	7.00						156	Little Kanawha	
WVLK-31-R		Island Run	12/14/99	0.46	1.19	7.90						72	Little Kanawha	
WVLK-31-W		Nancy Run	12/14/99	0.46	3.34	7.90						285	Little Kanawha	
WVLK-31-X		Tanner Run	12/14/99	0.58	1.33	7.40						74	Little Kanawha	
WVLK-31-X-1		Miletree Run	12/14/99	0.47	1.4	7.20						190	Little Kanawha	
WVLK-31-X-2		Scaffold Run	12/14/99	0.88	2.92	7.20						34	Little Kanawha	
WVLK-31-Y		Goff Run	12/14/99	0.38	0.86	7.20						48	Little Kanawha	
WVLK-31-Y-1		Laurel Run/Goff Run	12/14/99	0.53	0.56	7.00						20	Little Kanawha	
WVLK-31-Z	2.8	Left Fork/Spring Creek	12/14/99	0.36	1.31	6.40						140	Little Kanawha	
WVLK-31-Z	0	Left Fork/Spring Creek	12/14/99	0.46	2.11	6.70						190	Little Kanawha	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVLK-31-Z-1	0	Charles Fork	12/14/99	0.29	0.8	6.50						78	Little Kanawha	
WVLK-31-Z-1	2.9	Charles Fork	12/14/99	0.49	2.36	7.30						266	Little Kanawha	
WVLK-31-Z-2		Daniels Run	12/14/99	0.33	0.84	6.40						36	Little Kanawha	
WVLK-31-Z-3		Vandale Fork	12/14/99	0.4	0.96	6.50						78	Little Kanawha	
WVMC-11	1	Bull Run	6/25/01	13.4	14.9	3.24						1	Cheat	13.54
WVMC-16-A	0.8	South Fork/Greens Run	6/18/01	25.9	28	2.69						1	Cheat	20.6
WVMC-16-A	0.5	South Fork/Greens Run	6/20/01	28.8	31.1	2.69						4	Cheat	15.25
WVMC-16-A-1	0	UNT/South Fork RM 0.6/Greens Run	6/20/01	32.1	34.4	2.72						15	Cheat	9.78
WVMC-17	0	Muddy Creek	6/20/01	11	11.1	3.13						13	Cheat	15.37
WVMC-17	3.37	Muddy Creek	6/18/01	0.66	2.23	4.83						16	Cheat	
WVMC-17-A	0	Martin Creek	6/19/01	36.5	39.1	2.90						2	Cheat	13.68
WVMC-17-A-0.5	0	Flckey Run	6/25/01	69.3	75.1	2.70						4	Cheat	9.78
WVMC-24		Heather Run	6/19/01	13.6	15.3	2.97						1	Cheat	18.99
WVMC-25		Lick Run/Cheat River	6/19/01	42.5	48	2.65						3	Cheat	17.3
WVMC-27		Pringle Run	6/19/01	6.83	7.86	3.84						2	Cheat	31.99
WVMT-12	11.2	Three Fork Creek	9/25/02	7.46	7.46	4.46					<	3	Tygart Valley	49.8
WVMT-12	0.3	Three Fork Creek	9/26/02	1.53	1.87	4.88						6	Tygart Valley	53.55
WVMT-12	11.2	Three Fork Creek	9/25/02	7.92	7.92							4	Tygart Valley	33.04
WVMT-12-C	0.1	Raccoon Creek	9/25/02	8.33	8.33	4.43					<	3	Tygart Valley	51.2
WVMT-12-G	0	Fields Creek	9/25/02	0.23	0.27	5.11						4	Tygart Valley	
WVMT-12-H	0.1	Birds Creek	9/25/02	16	16.6	4.04						3	Tygart Valley	23.54
WVMT-18	3.5	Sandy Creek	10/1/02	0.91	0.92	6.62						6	Tygart Valley	48.29
WVMT-18-E	0.7	Little Sandy Creek	10/1/02	2.81	2.81	5.62					<	3	Tygart Valley	
WVMT-18-E-3	0	Left Fork/Little Sandy Creek	10/1/02	24.4	24.9	5.46					<	3	Tygart Valley	9.78
WVMT-37	0	Beaver Creek	10/2/02	8.88	8.89	3.38					<	3	Tygart Valley	21.21
WVMT-42	0.2	Roaring Creek	9/25/02	15.7	15.7	3.11						12	Tygart Valley	11.84
WVMT-42	9.3	Roaring Creek	10/3/02	0.38	0.42	4.89					<	3	Tygart Valley	
WVMT-42	6.3	Roaring Creek	10/3/02	0.3	0.34	5.55					<	3	Tygart Valley	
WVMT-42-B	0	Flatbush Fork	10/3/02	0.88	0.88	4.33					<	3	Tygart Valley	
WVMTB-11-B	0.5	Mud Lick	10/3/02	0.54	0.54	4.18					<	3	Tygart Valley	
WVMTB-11-B.7	0.1	Bridge Run	10/3/02	2.72	2.72	3.38						10	Tygart Valley	
WVMTM-16	1.5	Cassity Fork	9/24/02	56.9	56.9	3.06					<	3	Tygart Valley	46.17
WVO-100-{0.3}-Discharge		Clay Mine Discharge into Hardin Run	12/4/01	24	30	3.29						93	Upper Ohio North	
WVO-100-{0.3}-Discharge		Clay Mine Discharge into Hardin Run	1/8/02	11.4	12.3	3.47						57	Upper Ohio North	
WVO-100-{0.3}-Discharge		Clay Mine Discharge into Hardin Run	2/5/02	6.59	7.44	3.85						36.8	Upper Ohio North	
WVO-100-{0.3}-Discharge		Clay Mine Discharge into Hardin Run	3/19/02	1.73	4.24	5.56						27.6	Upper Ohio North	
WVO-101	0.2	Deep Gut Run	9/10/01	4.16	4.17	3.23					<	5	Upper Ohio	
WVO-101	0.2	Deep Gut Run	8/20/01	3.8	4	3.42						9	Upper Ohio	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVO-101	0.2	Deep Gut Run	10/23/01	3.8	3.8	3.42					<	5	Upper Ohio	
WVO-101	0.2	Deep Gut Run	11/5/01	1.65	2.08	4.00						5	Upper Ohio	
WVO-101	0.2	Deep Gut Run	7/23/01	1.83	2.02	5.54						12	Upper Ohio	
WVO-101	2	Deep Gut Run	9/10/01	0.12	0.31	7.63						18	Upper Ohio	
WVO-101-E	0	UNT/Deep Gut Run RM 1.8	9/10/01	0.17	0.17	7.59						20	Upper Ohio	
WVO-21-B-2	0	UNT/Robinson Run	4/17/00	0.48	6.6	6.50						140	Middle Ohio	
WVO-21-B-2	0.8	UNT/Robinson Run	4/17/00	0.71	5.1	6.90						110	Middle Ohio	
WVO-23	3.4	Tenmile Creek	8/19/03	4.02	7.05	6.39						10	Middle Ohio	50.7
WVO-3	7.7	Fourpole Creek	1/24/02	0.097	10.4	7.32						532	Lower Ohio	
WVO-3	4.8	Fourpole Creek	1/24/02	0.0898	16.8	7.51						896	Lower Ohio	
WVO-3	7	Fourpole Creek	1/24/02	0.097	6.26	7.60						254	Lower Ohio	
WVO-3	7.5	Fourpole Creek	10/9/01	0.21	0.23								Lower Ohio	
WVO-3	1.6	Fourpole Creek	10/9/01	0.24	0.25								Lower Ohio	
WVO-3	1.6	Fourpole Creek	11/7/01	0.13	0.26								Lower Ohio	
WVO-3-B	0.1	Grapevine Branch	1/24/02	0.101	14.3	7.27						876	Lower Ohio	
WVO-3-B	0	Grapevine Branch	10/9/01	0.15	0.18								Lower Ohio	
WVO-95	3.5	Cross Creek	9/12/01	0.23	0.24	8.16						5	Upper Ohio	
WVO-95	7.8	Cross Creek	5/21/02	0.13	0.52	8.21						8.4	Upper Ohio	
WVO-95	7.8	Cross Creek	4/16/02	0.12	0.58	8.26						15.6	Upper Ohio	
WVO-95	7.8	Cross Creek	9/11/01	0.14	0.22	8.36						5	Upper Ohio	
WVO-95	7.8	Cross Creek	6/18/02	0.13	0.28	8.38						5.6	Upper Ohio	
WVO-95	5	Cross Creek	4/16/02	0.11	0.5	8.39						11.2	Upper Ohio	
WVO-95	5.05	Cross Creek	9/11/01	0.1	0.18	8.42						5	Upper Ohio	
WVO-95	1.1	Cross Creek	4/15/02	0.09	0.48	8.42						13.2	Upper Ohio	
WVO-95-B	0	Ebenezer Run	9/11/01	0.19	0.29	8.45					<	5	Upper Ohio	
WVO-95-C	0	North Potrock Run	9/11/01	0.1	0.26	8.32					<	5	Upper Ohio	
WVO-95-F	0	UNT/Cross Creek RM 6.9	9/11/01	0.12	0.36	8.39						5	Upper Ohio	
WVO-97	7.2	Harmon Creek	9/11/01	0.14	0.15	7.34						11	Upper Ohio	
WVO-97	1.2	Harmon Creek	9/11/01	0.16	0.22	7.85						16	Upper Ohio	
WVO-97-0.7A	0	UNT/Harmon Creek RM 2.9	9/11/01	0.14	0.14	7.92					<	5	Upper Ohio	
WVO-97-0.9A	0	UNT/Harmon Creek RM 3.2	9/12/01	0.12	0.22	7.95					<	5	Upper Ohio	
WVO-97-B	0	Alexanders Run	9/10/01	0.12	0.19	7.41						12	Upper Ohio	
WVO-97-B	2.8	Alexanders Run	9/12/01	0.1	0.18	7.87					<	5	Upper Ohio	
WVO-97-B.5	0	UNT/Harmon Creek RM 5.4	9/11/01	0.13	0.48	7.79						14	Upper Ohio	
WVO-97-D	0	Brown Hollow	9/11/01	0.12	0.34	7.70						11	Upper Ohio	
WVO-98	0.1	Kings Creek	9/12/01	0.23	0.26	7.77						11	Upper Ohio	
WVO-98-0.5A	0	Turkeyfoot Run	9/11/01	0.1	0.22	7.69						5	Upper Ohio	
WVO-98-A.5	0	Marrow Run	9/11/01	0.14	0.17	7.99						7	Upper Ohio	
WVOG	79.5	Guyandotte River	9/4/03	0.18	4.92	7.23						1870		
WVOG	2.8	Guyandotte River	9/4/03	0.16	0.29	7.34						3		
WVOG	79.5	Guyandotte River	6/16/03	0.28	2	7.65						190	Lower	
WVOG-110	0.2	Indian Creek	9/6/00	0.11	0.45	8.47							Upper	71.21
WVOG-124	0.7	Pinnacle Creek	9/5/00	0.15	0.18	8.21							Upper	60.47

ANCode	Mile Pclnt	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVOG-124-D		Smith Branch/Pinnacle Creek	9/6/00	0.22	0.35	8.25							Upper	52.69
WVOG-134-D		Measle Fork	9/5/00	5.79	5.79	3.70							Upper	68.04
WVOG-139	0	Stonecoal Creek	9/6/00	0.089	0.164	7.99						8	Upper	52.01
WVOG-65-B-1-A		Lower Dempsey Branch	8/23/00	0.19	3.7	5.62						37	Upper	53.19
WVOG-65-B-1-E		Upper Dempsey Branch	8/23/00	6.7	6.7	4.72					<	5	Upper	29.26
WVOG-65-B-4-C	0.1	UNT/Trace Fork RM 0.6	4/1/04	21.8	21.8	3.01						14	Upper	
WVOG-65-B-4-C	0.1	UNT/Trace Fork RM 0.6	3/16/04	10.4	10.4	3.08						6	Upper	
WVOG-75	18	Buffalo Creek	8/30/00	2.26	9.96	5.00							Upper	
WVOG-77-A.5		Oldhouse Branch/Rockhouse	8/31/00	7.4	8	4.37						30	Upper	31.2
WVOG-96	1.6	Big Cub Creek	9/5/00	0.2	0.2	8.00						2	Upper	63.14
WVOG-96-B	0.4	Road Branch	9/5/00	0.3	0.4	7.58						6	Upper	67.32
WVOG-96-F		Toler Hollow	9/6/00	0.18	0.38	8.12						8	Upper	58.5
WVOG-96-H		McDonald Fork	9/6/00	0.11	0.22	7.96						4	Upper	63.03
WVOG-99		Reedy Branch	9/6/00	0.13	0.22	7.63						6	Upper	65.91
WVOGC-16-U		Franks Fork	8/29/00	0.11	0.18	7.33							Upper	50.46
WVOGC-26		Crane Fork	8/30/00	0.13	1.04	7.25							Upper	49.3
WVPNB-11	0.5	Montgomery Run	1/13/03	7.04	7.04	3.48						9	North Branch	
WVPNB-11	0.5	Montgomery Run	3/11/03	6.03	6.09	3.52						20	North Branch	
WVPNB-11	0.1	Montgomery Run	3/11/03	5.21	5.21	3.60						20	North Branch	
WVPNB-11	0.1	Montgomery Run	1/13/03	6.29	6.29	3.88						9	North Branch	
WVPNB-11	0.5	Montgomery Run	4/15/03	3.86	4.67	4.09						7.6	North Branch	
WVPNB-11	0.1	Montgomery Run	4/15/03	3.15	4.21	4.76						10	North Branch	
WVPNB-11	1.4	Montgomery Run	4/15/03	0.28	0.52	4.81						3.6	North Branch	
WVPNB-11	1.4	Montgomery Run	1/13/03	3.13	3.46	4.91						3	North Branch	
WVPNB-11	1.4	Montgomery Run	5/6/03	1.69	2.19	5.10					<	3	North Branch	
WVPNB-11	0.1	Montgomery Run	7/9/02	0.14	2.02	7.88						9.6	North Branch	
WVPNB-11	0.1	Montgomery Run	8/6/02	0.13	1.49	7.97						9.2	North Branch	
WVPNB-11	0.1	Montgomery Run	8/6/02	0.13	1.53							9.2	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	11/19/02	4.08	4.11	4.64					<	3	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	8/6/02	1.93	5.74	4.98						19.8	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	12/9/02	11.1	11.1	5.01					<	3	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	11/13/02	3.79	3.79	5.14					<	3	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	5/6/03	0.53	1.51	5.49						4	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	1/13/03	1.26	1.26	5.58					<	3	North Branch	
WVPNB-11-A	0	UNT/Montgomery Run RM 1.4	4/15/03	0.34	0.52	5.79						3.2	North Branch	
WVPNB-12	0	Piney Swamp Run	10/8/02	17.4	17.8	3.11					<	3	North Branch	
WVPNB-12	0	Piney Swamp Run	6/26/02	16.1	16.1	3.26						5.6	North Branch	
WVPNB-12	0	Piney Swamp Run	2/10/03	8.01	8.01	3.30					<	3	North Branch	
WVPNB-12	0	Piney Swamp Run	1/13/03	4.89	4.89	3.43						7	North Branch	
WVPNB-12	0	Piney Swamp Run	4/15/03	6.45	6.47	3.62						8.8	North Branch	
WVPNB-12	0	Piney Swamp Run	12/9/02	9.07	9.09	3.63						9	North Branch	
WVPNB-12	0	Piney Swamp Run	8/6/02	11.3	11.3	3.63						7.6	North Branch	
WVPNB-12	0	Piney Swamp Run	3/12/03	4.02	4.61	3.96						13.6	North Branch	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVPNB-12	0	Piney Swamp Run	5/6/03	4.52	4.78	3.96						12	North Branch	
WVPNB-12	0	Piney Swamp Run	11/12/02	4.19	4.47	4.03						26	North Branch	
WVPNB-12	0	Piney Swamp Run	11/19/02	3.68	3.82	4.15						6	North Branch	
WVPNB-12	2.2	Piney Swamp Run	2/10/03	1.47	1.47	4.75					<	3	North Branch	
WVPNB-12	2.2	Piney Swamp Run	12/9/02	1.52	1.61	4.77						4	North Branch	
WVPNB-12	2.2	Piney Swamp Run	11/12/02	1.2	1.47	4.86						10	North Branch	
WVPNB-12	3.2	Piney Swamp Run	10/8/02	0.55	0.56	4.98					<	3	North Branch	
WVPNB-12	3.2	Piney Swamp Run	8/6/02	0.65	0.7	5.02						4.8	North Branch	
WVPNB-12	3.2	Piney Swamp Run	6/26/02	0.4	0.46	5.19						4.8	North Branch	
WVPNB-12	1.6	Piney Swamp Run	3/11/03	0.77	1.92	5.19						10	North Branch	
WVPNB-12	1.6	Piney Swamp Run	1/13/03	0.98	2.02	5.22						8	North Branch	
WVPNB-12	2.2	Piney Swamp Run	1/13/03	0.47	0.99	5.23						9	North Branch	
WVPNB-12	1.6	Piney Swamp Run	2/10/03	0.71	1.61	5.41						4	North Branch	
WVPNB-12	1.6	Piney Swamp Run	11/19/02	1.95	1.95	5.47						11	North Branch	
WVPNB-12	3.2	Piney Swamp Run	12/9/02	0.19	0.55	5.51						4	North Branch	
WVPNB-12	1.6	Piney Swamp Run	4/15/03	0.59	1.93	5.57						18.4	North Branch	
WVPNB-12	3.2	Piney Swamp Run	3/11/03	0.19	0.56	5.62						4	North Branch	
WVPNB-12	2.2	Piney Swamp Run	11/19/02	0.26	0.81	5.66						6	North Branch	
WVPNB-12	3.2	Piney Swamp Run	2/10/03	0.3	0.52	5.73					<	3	North Branch	
WVPNB-12	1.6	Piney Swamp Run	12/9/02	0.15	1.51	5.79						8	North Branch	
WVPNB-12	1.6	Piney Swamp Run	5/6/03	0.18	1.62	5.79						19	North Branch	
WVPNB-12	3.2	Piney Swamp Run	4/15/03	0.09	0.69	5.84						12.8	North Branch	
WVPNB-12	2.2	Piney Swamp Run	3/11/03	0.11	0.72	5.86						6.8	North Branch	
WVPNB-12	3.2	Piney Swamp Run	1/13/03	0.13	0.38	5.92						3	North Branch	
WVPNB-12	3.2	Piney Swamp Run	11/19/02	0.1	0.43	6.09						4	North Branch	
WVPNB-12	3.2	Piney Swamp Run	11/12/02	0.1	1.26	6.25						37	North Branch	
WVPNB-12	3.2	Piney Swamp Run	10/8/02	0.55	0.56						<	3	North Branch	
WVPNB-12-(2.4)-Mine		Mine Seep into Piney Swamp Run	10/8/02	8.81	9.68	4.59						9	North Branch	
WVPNB-12-(2.4)-Mine		Mine Seep into Piney Swamp Run	2/10/03	1.03	3.13	5.22						16	North Branch	
WVPNB-12-(2.4)-Mine		Mine Seep into Piney Swamp Run	12/9/02	1.5	3.21	5.80						14	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	3/11/03	2.34	5.4	3.87						3.2	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	8/6/02	9.79	9.79	4.25						3.2	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	5/6/03	5.81	6.7	4.51						4	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	4/15/03	8.18	8.2	4.63					<	3	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	12/9/02	8.37	9.12	4.69					<	3	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	1/13/03	6.63	6.63	4.89					<	3	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	2/10/03	7.99	7.99	4.91					<	3	North Branch	
WVPNB-12-B	0	UNT/Piney Swamp Run RM 0.7	11/19/02	2.87	5.18	5.41						15	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	10/8/02	16.1	16.2	3.49						8	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	11/12/02	7.55	7.55	4.29						13	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	7/9/02	11.3	11.4	4.43						7.2	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	8/6/02	10.2	11.1	4.47						12.4	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	12/9/02	8.76		4.85						16	North Branch	

ANCode	Mile Point	Stream Name	Date	Dis Al	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	4/15/03	4.84	6.62	4.85						8.4	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	5/6/03	4.61	8.09	4.91						16	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	3/11/03	4.36	4.41	4.94						6.4	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	1/13/03	4.33	6.84	4.94						13	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	2/10/03	7.61	10.3	4.97						24	North Branch	
WVPNB-12-E	0	UNT/Piney Swamp Run RM 1.8	11/19/02	4.34	6.11	5.14						11	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	5/6/03	8.16	8.29	4.41						6	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	4/15/03	8.22	8.53	4.58						5.2	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	1/13/03	8.62	8.87	4.61						10	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	3/11/03	7.65	10.8	4.64						3.6	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	11/19/02	11.3	11.3	4.72						15	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	11/12/02	5.87	14.2	4.78						82	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	2/10/03	4.35	7.05	5.15						20	North Branch	
WVPNB-12-F	0	UNT/Piney Swamp Run RM 2.2	12/9/02	1.26	6.24	5.36						27	North Branch	
WVPNB-16	15.8	Abrams Creek	6/25/02	3.99	3.99	4.27						6	North Branch	
WVPNB-16	15.8	Abrams Creek	8/12/02	3.84	4.02	4.30						4	North Branch	
WVPNB-16	15.8	Abrams Creek	4/17/03	3.76	3.85	4.58						5	North Branch	
WVPNB-16	15.8	Abrams Creek	3/13/03	1.76	2.05	4.61						6.4	North Branch	
WVPNB-16	17.7	Abrams Creek	5/8/03	5.31	5.51	4.70						8	North Branch	
WVPNB-16	3.1	Abrams Creek	7/17/02	1.16	1.16	4.74					<	3	North Branch	
WVPNB-16	9	Abrams Creek	10/9/02	2.4	2.63	4.78						3	North Branch	
WVPNB-16	3.1	Abrams Creek	10/8/02	1.15	1.67	4.79					<	3	North Branch	
WVPNB-16	17.7	Abrams Creek	10/10/02	1.81	3.05	4.84						8	North Branch	
WVPNB-16	9	Abrams Creek	8/7/02	2.01	2.18	4.87					<	3	North Branch	
WVPNB-16	9	Abrams Creek	7/11/02	2.35	2.57	4.88					<	3	North Branch	
WVPNB-16	17.7	Abrams Creek	4/14/03	1.59	1.98	4.89						4	North Branch	
WVPNB-16	15.8	Abrams Creek	10/10/02	1.86	2.68	4.91						22	North Branch	
WVPNB-16	9	Abrams Creek	4/17/03	1.47	2.44	4.92						9	North Branch	
WVPNB-16	17.7	Abrams Creek	2/12/03	2.23	2.46	4.98						3	North Branch	
WVPNB-16	17.7	Abrams Creek	8/12/02	1.24	2.3	4.98						8.4	North Branch	
WVPNB-16	15.8	Abrams Creek	11/11/02	1.17	1.34	5.04						6	North Branch	
WVPNB-16	15.8	Abrams Creek	12/10/02	1.67	2.11	5.12						10	North Branch	
WVPNB-16	3.1	Abrams Creek	8/6/02	0.64	0.72	5.12						4.4	North Branch	
WVPNB-16	9	Abrams Creek	11/11/02	0.46	0.94	5.21						5	North Branch	
WVPNB-16	15.8	Abrams Creek	5/8/03	0.68	1.89	5.21						20	North Branch	
WVPNB-16	15.8	Abrams Creek	2/12/03	1.87	1.87	5.22						6	North Branch	
WVPNB-16	15.8	Abrams Creek	11/21/02	1.34	1.44	5.26						4	North Branch	
WVPNB-16	17.7	Abrams Creek	3/10/03	1.24	1.77	5.29						18.4	North Branch	
WVPNB-16	17.7	Abrams Creek	11/21/02	1.36	1.4	5.29					<	3	North Branch	
WVPNB-16	9	Abrams Creek	12/11/02	0.73	2.5	5.31						14	North Branch	
WVPNB-16	17.7	Abrams Creek	12/10/02	1.06	1.55	5.33					<	3	North Branch	
WVPNB-16	17.7	Abrams Creek	1/15/03	0.9	1.66	5.39						6	North Branch	
WVPNB-16	9	Abrams Creek	3/13/03	0.27	1.91	5.52						11.6	North Branch	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVPNB-16	17.7	Abrams Creek	11/11/02	2.35	2.35	5.65					<	3	North Branch	
WVPNB-16	3.1	Abrams Creek	4/16/03	0.22	1.37	5.66						9.6	North Branch	
WVPNB-16	0	Abrams Creek	10/8/02	0.2	0.58	5.68					<	3	North Branch	
WVPNB-16	9	Abrams Creek	2/11/03	0.21	2.17	5.77						14	North Branch	
WVPNB-16	9	Abrams Creek	11/20/02	0.16	1.08	5.82						8	North Branch	
WVPNB-16	9	Abrams Creek	5/8/03	0.16	2.02	5.93						12	North Branch	
WVPNB-16	3.1	Abrams Creek	1/14/03	0.1	0.58	6.07					<	3	North Branch	
WVPNB-16	3.1	Abrams Creek	12/11/02	0.1	1.43	6.16						8	North Branch	
WVPNB-16	9	Abrams Creek	1/15/03	0.47	1.45	6.55						7	North Branch	
WVPNB-16-0.5A	0	UNT/Abrams Creek RM 1.9	5/6/03	0.09	0.39	7.67						10	North Branch	
WVPNB-16-A	1.7	Emory Run	3/11/03	4.38	4.56	4.33						6.4	North Branch	
WVPNB-16-A	1.7	Emory Run	1/14/03	4.13	4.13	4.36						4	North Branch	
WVPNB-16-A	0	Emory Run	10/8/02	3.19	3.46	4.52					<	3	North Branch	
WVPNB-16-A	1.7	Emory Run	12/11/02	4.38	4.82	4.61						12	North Branch	
WVPNB-16-A	0	Emory Run	1/14/03	1.72	2.78	4.62						7	North Branch	
WVPNB-16-A	1.7	Emory Run	2/11/03	3.78	4.06	4.71						5	North Branch	
WVPNB-16-A	1.7	Emory Run	8/12/02	2.13	5.05	4.83						12	North Branch	
WVPNB-16-A	1.7	Emory Run	11/20/02	2.54	3	4.85						6	North Branch	
WVPNB-16-A	1.7	Emory Run	10/9/02	2.5	3.79	4.92						8	North Branch	
WVPNB-16-A	0	Emory Run	8/6/02	1.34	2.43	4.94						10	North Branch	
WVPNB-16-A	1.7	Emory Run	11/13/02	1.04	1.77	5.02						9	North Branch	
WVPNB-16-A	1.7	Emory Run	4/6/03	1.68	2.49	5.06						9.2	North Branch	
WVPNB-16-A	0	Emory Run	3/11/03	1.06	2.68	5.06						16	North Branch	
WVPNB-16-A	0	Emory Run	7/17/02	0.61	1.74	5.15						4.4	North Branch	
WVPNB-16-A	0	Emory Run	11/20/02	0.54	2.74	5.23						14	North Branch	
WVPNB-16-A	0	Emory Run	4/16/03	0.41	2.72	5.24						22	North Branch	
WVPNB-16-A	0	Emory Run	2/11/03	0.62	3.26	5.25						14	North Branch	
WVPNB-16-A	0	Emory Run	12/11/02	0.56	6.46	5.28						40	North Branch	
WVPNB-16-A	1.7	Emory Run	5/8/03	0.14	1.52	5.46						12	North Branch	
WVPNB-16-A	0	Emory Run	11/13/02	0.2	1.64	5.56						14	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	10/8/02	4.08	4.86	3.36					<	3	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	7/9/02	5.84	5.84	3.59						3.6	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	8/6/02	3.95	3.95	3.77					<	3	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	1/14/03	1.98	2.2	4.58						4	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	11/20/02	1.61	2.43	4.79						14	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	11/13/02	1.01	1.37	4.87						9	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	2/11/03	0.3	2.6	5.69						14	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	3/11/03	0.31	1.88	5.70						31.6	North Branch	
WVPNB-16-A-1	0	UNT/Emory Run RM 0.8	12/11/02	0.14	16.4	5.95						162	North Branch	
WVPNB-16-B.5	0	Glade Run	6/27/02	2.15	2.15	3.94						14	North Branch	
WVPNB-16-B.5	0	Glade Run	10/9/02	2.17	2.21	4.44						10	North Branch	
WVPNB-16-B.5	0	Glade Run	8/7/02	1.84	1.91	4.73						11.6	North Branch	
WVPNB-16-B.5	0	Glade Run	2/12/03	0.15	0.78	5.81						6	North Branch	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVPNB-16-B.5-1	0	UNT/Glade Run RM 0.3	10/9/02	2.85	2.94	4.53						5	North Branch	
WVPNB-16-B.5-1	0	UNT/Glade Run RM 0.3	8/7/02	1.75	2.08	4.96						7.2	North Branch	
WVPNB-16-C	0.2	Laurel Run	10/9/02	8.94	8.94	4.57					<	3	North Branch	
WVPNB-16-C	0.2	Laurel Run	6/27/02	8.23	9	4.59						5.6	North Branch	
WVPNB-16-C	0.2	Laurel Run	8/7/02	6.11	6.52	4.73						6	North Branch	
WVPNB-16-C	0.2	Laurel Run	2/13/03	3.26	5.84	4.81						13	North Branch	
WVPNB-16-C	0.2	Laurel Run	12/12/02	3.62	4.97	4.84						8	North Branch	
WVPNB-16-C	0.2	Laurel Run	4/16/03	2.72	4.51	4.85						14	North Branch	
WVPNB-16-C	0.2	Laurel Run	11/20/02	2.14	2.32	4.98						4	North Branch	
WVPNB-16-C	0.2	Laurel Run	3/12/03	3.6	5.01	4.98						12.8	North Branch	
WVPNB-16-C	0.2	Laurel Run	1/14/03	2.8	3.81	5.03						8	North Branch	
WVPNB-16-C	0.2	Laurel Run	5/8/03	1.69	4.3	5.03						18	North Branch	
WVPNB-16-C	0.2	Laurel Run	11/13/02	1.1	2.18	5.07						16	North Branch	
WVPNB-16-C	0.2	Laurel Run	11/20/02	2.21	2.41						<	3	North Branch	
WVPNB-16-C.4	0	UNT/Abrams Creek RM 13.6	4/16/03	6.26	8.01	4.84						5.6	North Branch	
WVPNB-16-C.4	0	UNT/Abrams Creek RM 13.6	1/14/03	2.13	4.85	5.04						18	North Branch	
WVPNB-16-C.4	0	UNT/Abrams Creek RM 13.6	7/10/02	3.21	6.63	5.28						21.6	North Branch	
WVPNB-16-C.4	0	UNT/Abrams Creek RM 13.6	8/7/02	0.5	3.38	5.85						14.8	North Branch	
WVPNB-16-C.4	0	UNT/Abrams Creek RM 13.6	11/20/02	0.1	2.2	6.31						8	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	10/10/02	23.7	24.3	2.99						4	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	8/12/02	34.3	34.3	3.23					<	3	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	7/11/02	19.8	19.8	3.41						3.6	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	1/15/03	17.2	17.2	3.52						10	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	4/17/03	25.4	25.4	3.54						5	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	3/13/03	10.9	10.9	3.89						9.2	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	12/10/02	14.1	14.1	3.89						6	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	2/12/03	12.2	12.6	4.02						6	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	11/11/02	6.94	6.94	4.13						4	North Branch	
WVPNB-16-C.8	0	UNT/Abrams Creek RM 15.9	5/8/03	5.18	5.45	4.41						9	North Branch	
WVPNB-16-D	0	Little Creek	4/14/03	1.91	2.19	4.68						6	North Branch	
WVPNB-16-D	0	Little Creek	11/21/02	1.99	1.99	4.85						4	North Branch	
WVPNB-16-D	0	Little Creek	11/11/02	1.54	1.54	4.85					<	3	North Branch	
WVPNB-16-D	0	Little Creek	1/15/03	1.7	1.75	5.05						6	North Branch	
WVPNB-16-D	0	Little Creek	3/10/03	1.6	1.87	5.08						6	North Branch	
WVPNB-16-D	0	Little Creek	12/10/02	1.33	1.53	5.17						3	North Branch	
WVPNB-16-D	0	Little Creek	2/12/03	1.02	1.22	5.17						4	North Branch	
WVPNB-17	6.9	Stony River	8/13/97	0.147	0.05	7.90							North Branch	77.5
WVPNB-19	0.5	Buffalo Creek	8/12/02	0.11	0.33	7.32						10	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	11/18/02	0.18	0.63	7.72						4	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	12/10/02	0.21	0.34	8.16						3	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	2/10/03	0.41	0.66	8.22						4	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	10/10/02	0.14	0.21	8.44						6	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	3/10/03	1.52	1.97	8.61						5.6	North Branch	

ANCode	Mile Point	Stream Name	Date	Dis Al (mg/L)	Total Al (mg/L)	pH	Q	Total Ca (mg/L)	Q	Total Mg (mg/L)	Q	TSS (mg/L)	Watershed	WVSCI
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	8/7/02	0.23	0.38	8.62						3.6	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	5/7/03	0.33	0.49	8.63					<	3	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	4/14/03	0.96	1.18	8.76					<	3	North Branch	
WVPNB-19-0.5A	0	UNT/Buffalo Creek RM 0.6	1/13/03	0.3	0.36	8.95					<	3	North Branch	
WVPNB-19-A	0	Little Buffalo Creek	10/10/02	4.64	6.61	4.54						14	North Branch	
WVPNB-19-A	0	Little Buffalo Creek	12/10/02	0.14	1.12	5.52						6	North Branch	
WVPNB-19-A	0	Little Buffalo Creek	11/11/02	0.62	0.86	6.13						7	North Branch	
WVPNB-19-A	0.6	Little Buffalo Creek	4/14/03	0.33	0.49	7.16						10	North Branch	
WVPNB-19-A-1	0	UNT/Little Buffalo Creek RM 0.6	7/8/02	416	422	2.55						7.6	North Branch	
WVPNB-22-A	0	Elk Run	11/12/02	0.09	0.82	6.78						28	North Branch	

WV ALUMINUM CRITERIA

Response Of Industry Groups To
Request For Information

June 25, 2004

TABLE OF CONTENTS

I. EXECUTIVE SUMMARY

Since the Environmental Quality Board (the "Board") originally adopted aluminum criteria in 1994, the chronic aluminum criterion has received much criticism because it is based on flawed science and does not accurately reflect toxicity that would occur in West Virginia waters. Previously, West Virginia deleted the chronic criterion from its water quality standards. EPA rejected the deletion of the chronic aluminum criterion because West Virginia failed to provide a scientific rationale for the deletion of the chronic criterion.

Other states, with the approval of EPA, have rejected the chronic aluminum criterion because of flawed science. In particular, on August 2, 2001, EPA Region III approved Pennsylvania's rejection of the chronic aluminum criterion due to the flawed science on which it is based. EPA's recent action in Pennsylvania indicates that EPA Region III may be receptive to the rejection of the chronic criterion if West Virginia provides a scientific rationale for that action.

Following EPA's protocol for deriving aquatic life criteria, the chronic criterion should be equal to the acute criterion of 750 µg/l. These concentrations are set as acid soluble concentrations. EPA has previously agreed with West Virginia that the dissolved aluminum concentration most closely resembles the bioavailable portion of the total aluminum concentration. **Accordingly, based on EPA's protocol, the following aluminum aquatic life criteria should be adopted by the Board:**

Acute criterion	**0.750 mg/l dissolved**
Chronic criterion	**0.750 mg/l dissolved**

II. INTRODUCTION

During its 2004 session, the West Virginia Legislature passed H.B. 4193, which mandates that the Environmental Quality Board (the "Board"), shall, with the cooperation of the Department of Environmental Protection ("DEP") and the regulated community, propose an emergency and legislative rule to revise the aluminum criteria in the West Virginia Water Quality Standards, 46 CSR §1. On April 27, 2004, West Virginia Coal Association, the West Virginia Chamber of Commerce, and the West Virginia Manufacturers Association (collectively the "Industry Groups") submitted a letter urging the Board to establish a schedule for discussion and the presentation of information in the aluminum criteria, with the goal of preparing proposed aluminum criteria for public comment no later than July 2004.

Following its May 2004 meeting, the Board circulated a "Request for Information on Aluminum Water Quality Standard." Specifically, the Board requested "information from all interested parties regarding appropriate aquatic life protection limits for aluminum." The Industry Groups have completed substantial work to review recent scientific information on aluminum toxicity to aquatic life and to prepare proposed criteria for consideration by the Board.

A timely resolution of this matter is important. On March 22, 2004, the West Virginia Department of Environmental Protection ("DEP") presented the 2004 Draft Section 303(d) List for public comment. As set forth on page 6 of the Listing Rationale document, "[t]he 2004 Draft Section 303(d) list includes 166 waters, comprising 2,090 stream miles, that are impaired pursuant to the new dissolved aluminum criteria." As presented to the Board in its past consideration of the aluminum criteria, many of the listed streams have thriving aquatic communities and have no physical signs of impairment. Because of this 303(d) listing, DEP will be required to prepare a Total Maximum Daily Load ("TMDL") for these streams, despite their thriving aquatic communities. Clearly, this will detract from DEP's ability to use its limited resources for developing TMDLs on streams with real

impairments and result in expenditures for controls that do not produce an environmental benefit.

III. HISTORY OF THE WEST VIRGINIA ALUMINUM CRITERIA

The aluminum criteria have been before the Board many times over the past ten years. However, the Board's membership has changed considerably over that time. Accordingly, a summary of the history of the aluminum criteria is outlined herein.

In 1994, at the urging of the United States Environmental Protection Agency ("EPA"), West Virginia adopted EPA's proposed aluminum aquatic life criteria of 87 µg/l for chronic exposures and 750 µg/l for acute exposures. While these criteria were proposed by EPA as acid soluble concentrations, the Environmental Quality Board ("Board") adopted these standards as total concentrations to correspond to the method of measurement required for NPDES (water discharge) permits.

In 1996, the West Virginia Division of Environmental Protection ("DEP") made a presentation to the Board regarding DEP stream data collected since 1990. This data indicated that 87.6% of all total aluminum samples collected (3,293 samples) from various streams throughout the state exceeded the Board's chronic aquatic life aluminum criterion of 87 µg/l total aluminum, and 28.5% of the stream samples exceeded the current acute aluminum aquatic life criterion of 750 µg/l total aluminum.

In its presentation, DEP outlined that although the chronic and often the acute aluminum criteria were exceeded, the majority of these streams support large, diverse and healthy populations of aquatic life. Using the Board's criteria in place at that time, DEP would have been required to place the vast majority of West Virginia's streams on the State's 303(d) list despite the fact that these streams are healthy. Further, DEP expressed its belief that EPA's recommended acute and chronic aluminum criteria are overprotective and inappropriate for many streams in West Virginia.

DEP's original presentation provided the groundwork for the Board's reconsideration of its aluminum criteria. Based on this presentation, the Board requested additional data to support DEP's belief that streams were not being adversely affected by total aluminum concentrations in excess of the Board's criteria. In addition, the Board created an informal aluminum task force to evaluate available toxicity data on aluminum and possible alternative aluminum criteria.

During the 1997 triennial review, the Board reevaluated its aluminum criteria in detail. Much time was devoted during the Board's meetings to examining EPA's document setting forth its rationale for EPA's recommended aluminum criteria, as well as EPA's guidance document for preparing aquatic life water quality criteria. Based on this review, the Board determined that EPA's criteria were not scientifically justifiable. In fact, had EPA followed its own guidance document for preparing water quality criteria, the chronic aluminum criterion would be equal to the acute aluminum criterion of 750 µg/l.[1] Accordingly, the Board determined that EPA's recommended chronic aluminum criterion was technically deficient and should be removed from the state water quality standards.

This modification was approved by the West Virginia Legislature and was submitted to EPA for approval. However, the justification provided to the EPA for the deletion of the chronic criterion did not mention the large amount of science supporting the Board's decision to delete the chronic criterion. Instead, the rationale document submitted to EPA simply referred to the large number of streams in West Virginia that violate the chronic criterion and the problems with issuing NPDES permits based upon the chronic criterion. A copy of the Board's rationale document is provided in Attachment A.

At the same time, DEP conducted its further study of the aluminum concentrations and aquatic life communities in West Virginia's streams. Following the Board's decision, DEP presented the results of its stream study to the Board in 1998. The

[1] The scientific justification for rejecting the chronic aluminum criterion is discussed in detail on pages 6 to 8 herein.

study indicated that many streams in the State with total aluminum concentrations in excess of 87 µg/l support healthy benthic communities. In addition, the study indicated that most of the streams with total aluminum concentrations in excess of 87 µg/l had nondetectable or very low concentrations of dissolved aluminum.

In addition, the Board's informal work group continued its study of the Board's aluminum criteria. The research done by this work group clearly indicates that the dissolved fraction of the total aluminum concentration is the portion that is toxic to aquatic life.

On June 22, 1999, EPA Region III notified the Board that it was disapproving the Board's deletion of the chronic aluminum criterion. EPA stated that the Board had failed to provide EPA with a scientific rationale to support the deletion of the chronic criterion. EPA requested that the Board take one of the following actions: (1) readopt the chronic criterion of 87 µg/l total aluminum, or (2) adopt an alternative chronic criterion that is scientifically defensible.

In 1999, the Board considered its alternatives to address EPA's disapproval of its deletion of the chronic aluminum criterion. A number of commenters requested that the Board provide a scientific justification for the deletion of the chronic criterion, and adopt a chronic criterion of 750 µg/l. Other commenters requested that the Board adopt dissolved aluminum criteria. After considering its alternatives, the Board decided that it would adopt dissolved aluminum criteria in place of the technically deficient total recoverable aluminum criteria. This revision was approved by EPA.

IV. LITERATURE REVIEW

The rationale for revision of the chronic aluminum criteria is based in part on an evaluation of the content and validity of the Criteria Document as well as a literature review of recent studies performed regarding aluminum toxicity. The results of these efforts are outlined briefly in this section. The best scientific evidence demonstrates that, for

streams which meet the West Virginia water quality standards for pH, a chronic criterion of 750 µg/l (0.75 mg/l) dissolved is scientifically justified and is protective of aquatic life.

A. EPA's Criteria Document

EPA's recommended aluminum criteria are set forth in EPA's *Ambient Aquatic Life Water Quality Criteria for Aluminum* (1988) ("Criteria Document"). The Criteria Document is provided in Attachment B. During the 1997 triennial review, the Board received detailed comments demonstrating that EPA's chronic criterion of 87 µg/l is scientifically flawed.

In fact, EPA failed to follow its own guidance document, (*Guidelines for Deriving Numerical National Water Quality Criteria for the Protection of Aquatic Organisms and their Uses* (1985), a summary of which is provided in Attachment C) (the "Guidelines") for setting aquatic life criteria when it established the chronic aluminum criterion of 87 µg/l. **If EPA had followed its guidance document, the chronic aluminum criterion would be equal to the acute criterion of 750 µg/l.**

The data relied upon by EPA to justify the current chronic aluminum criterion of 87 µg/l is inadequate. Chronic criteria are typically calculated by determining the acute to 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 *Guidelines*, EPA may adopt the species mean 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 studies to set the chronic criterion. (Cleveland, et al, 1989, on brook trout); (Buckler, et al., 1989, on striped bass). Copies of these two studies are provided in Attachment D. EPA's reliance on these two studies is seriously misplaced.

First, and most importantly, the *Guidelines* specify that a Species Mean Chronic Value for a commercially or recreationally important species may be adopted as the chronic criterion in place of a calculated chronic value. Neither of the two studies relied upon by EPA report final chronic values for brook trout or striped bass, and therefore cannot justify adopting a lower chronic criterion.

Second, the two studies had significant quality assurance and quality control 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. The Guidelines require that "[q]uestionable data, whether published or unpublished, should not be used." The dilution water in the striped bass study caused considerable mortality to 11-day-old fish (26%) and the 13-day-old fish (20% to 100% based on pH). The dilution water in the brook trout study caused an 11 percent mortality of juvenile brook trout in the pH 7.0 control group, and a 7.5 percent mortality in the pH 5.7 control group. The brook trout study monitored water quality in modified flow-through proportional diluters only once per week, which is insufficient to ensure constant water quality in the test chambers. Water quality in the striped bass study was monitored only twice per week. In addition, the brook trout study used a 0.1 μm filter in the dissolved aluminum measurement, while the applicable EPA analytical method requires the use of a 0.45 μm filter. While the striped bass study does not specify the filter size used, it was performed by the same scientists at virtually the same time and likely also used a 0.1 μm filter. This likely resulted in significantly lower aluminum concentrations than if they had been measured with a 0.45 μm filter.

Third, the studies are internally inconsistent. For example, toxicity tests on 160 day-old striped bass experienced 100% mortality at 349 µg/l. However, 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. The brook trout study was based on two separate exposure scenarios. However, the control groups between the two scenarios experienced very different mortalities at the same background aluminum concentration and virtually identical pH (10.8% at pH 7.0; 1.0% at pH 6.9).

Fourth, while neither study reports a final chronic value, both studies indicate that concentrations of aluminum significantly higher than 87 µg/l did not cause mortality. The striped bass study noted a significantly greater mortality only when aluminum concentrations exceeded 292 µg/l. Concentrations of aluminum as high as 390 µg/l did not cause mortality in striped bass.

Finally, the two studies do not correspond well to natural conditions in West Virginia streams. These studies generally were performed with water of low pH and low hardness. The water in the toxicity tests would violate West Virginia's water quality criteria for pH. The water in the brook trout study had an average hardness of 25 mg/l $CaCO_3$, with only 3 mg/l Ca^{+2}. Based on the water preparation method in the striped bass study, the water would be practically devoid of hardness. Other studies demonstrate that hardness plays an important role in mitigating the toxicity of aluminum. Further discussion of this issue is provided on pages 10 to 12 herein.

A letter from Eder Associates to EPA providing additional detail on the problems with these two studies and EPA's May 10, 1996, response are provided in Attachment E. In its response, EPA stated, "Available data indicates that aluminum is less toxic in waters having more typical hardness and neutral or higher pH, than in soft acidic waters. We are hoping to obtain sufficient data to rigorously account for this phenomenon." To date, no such work has been completed by EPA. However, a number of studies have been

conducted which demonstrate the effect of hardness and other factors on aluminum toxicity. These studies are discussed in the following section.

B. Recent Studies on Aluminum Toxicity

When EPA published the Criteria Document, EPA's recommended aluminum criteria were based on the limited information available at that time. Since then, a significant amount of new research has been conducted on aluminum bioavailability and toxicity. A literature review of recent studies on aluminum toxicity shows that it is the form and bioavailability of aluminum in the water column that determines its toxicity.

Assessments of fish, benthic macroinvertebrates, and other aquatic biota conducted under the auspices of the National Acid Precipitation Assessment Program ("NAPAP") clearly document that the amount of total recoverable aluminum within a given stream provides no meaningful information regarding aluminum toxicity. Instead, it is the form and bioavailability of the metal in the water column combined with the relevant chemical properties of surface waters (e.g., pH, acid neutralizing capacity, etc.) that determine aluminum toxicity. NAPAP Report 9 (Current Status of Surface Water Acid-Base Chemistry) and Report 13 (Biological Changes in Surface Water Acid-Base Chemistry).

These reports also outline that the single most important chemical parameter that determines the toxicity of aluminum is pH. If a stream has a seasonal or continuously low pH (<5.5-6.0) and little buffering capacity, then the form of aluminum present in the water column will generally be bioavailable, and if present in a high enough concentration, toxic. However, at a pH in the range from 6.6 to 8.8, the form of aluminum in the water column is not generally bioavailable or toxic. In other words, in those streams that meet the West Virginia water quality criteria for pH, the aluminum is not in the stream is not bioavailable and is not toxic to aquatic life.

The NAPAP literature also shows that many acidic surface waters with pH <5.5 have elevated concentrations of the toxic form of aluminum (i.e., inorganic monomeric aluminum). NAPAP Report 9. The studies referenced in these reports also show that

measurements of labile monomeric aluminum serve as better predictors of potential biotic effects than do total aluminum concentrations.

The sum of the three primary forms of aluminum that make up the inorganic monomeric aluminum include the aluminum hydroxide complexes [$Al(OH)^{+2}$ and $Al(OH)^{+3}$] and the free aluminum ion (Al^{+3}). However, inorganic monomeric aluminum is generally not present in the water column at a higher pH range. At a pH >6.0, the monomeric aluminum converts to an insoluble precipitate. This relationship between increasing inorganic monomeric aluminum concentrations at pH<6.0 and very low inorganic monomeric aluminum concentrations at pH>6.0 is documented by Wigington, et al. (1996).

A recent comprehensive literature review conducted by Gensemer, et al. (1999), confirms previous studies documenting that bioavailable aluminum acts as a gill toxicant to adult fish, and that this toxicity is manifested where the water column pH is low and the monomeric forms of aluminum are present. A copy of the Gensemer report is provided in Attachment F. Further, scientists now have a much greater understanding of the mechanisms that cause toxicity at the gill surface than they did back in 1988 when EPA last updated its aluminum criteria document. In a paper presented at the 20th Annual Meeting of the Society of Environmental Toxicology and Chemistry (1999), Gensemer et al. speculated that calcium-related hardness reduced aluminum toxicity by stabilizing fish gills by out-competing Al for binding sites on the epithelial membrane.

Gensemer's review of the bioavailability and toxicity of aluminum in aquatic environments provides more than adequate documentation of the effect of pH on aluminum toxicity and further explains the problems with the chronic criterion in the Criteria Document. Gensemer's research also demonstrates that the criteria should be established based on dissolved aluminum concentrations. Further, Gensemer suggests that EPA should update the Criteria Document to address the ameliorating effects that water hardness, dissolved organic matter, and other water quality characteristics have on aluminum toxicity.

EPA should initiate a thorough and comprehensive review and update of its Criteria Document.

Gensemer's review references a 1996 literature review by Donald W. Sparling and T. Peter Lowe, a copy of which is provided in Attachment G. The Sparling summary provides a detailed review of toxicity studies performed on plants, invertebrates, fish, and wildlife. The literature review states, "The toxicity of aluminum is intimately associated with pH in that the metal is soluble and biologically available in acidic (pH<5.5) soils and water but relatively innocuous in circumneutral (pH 5.5-7.5) conditions." The Sparling review indicates that aluminum toxicity is "greatly influenced by" alkalinity, acidity, calcium, dissolved organic carbon, and fluoride. Specifically, the Sparling review cites studies which indicate that small increases in calcium levels "can dramatically improve" alevin and adult survival of brown trout, brook trout, and rainbow trout when exposed to waters with low pH and elevated aluminum concentrations. The hardness-related protective mechanism was confirmed by Lyderson, et al. (2002), who tested the mitigating effect of ionic strength on the toxicity of aluminum in fish. Their study demonstrated that increasing the water ionic strength by adding Ca or Na reduced the toxic effect of aluminum. They concluded that Ca and Na mitigate the aluminum toxicity by their effect on the ability for aluminum to bind with the gill surface.

As set forth in the recently updated Toxicology Profile for Aluminum (1999), aluminum is the most abundant metal and third most abundant element, after oxygen and silicon, in the earth's crust. It is commonly found in soil, minerals, rocks, and clays. It also occurs as bauxite ore. Aluminum concentrations in soil can range from 0.07% by weight (700 ppm) up to and over 10% by weight (100,000 ppm). The typical concentration is around 7.1% by weight (71,000 ppm). *Most aluminum containing compounds do not dissolve much in water unless the water is acidic.*

Aluminum occurs ubiquitously in natural waters as a result of weathering of aluminum-containing clays, rocks, and minerals. The toxicological profile also states that

aluminum can also be mobilized from terrestrial environments through acidification (e.g., seasonal snow melts, runoff into streams with low acid neutralizing capacity, or from acid mine drainage); however, at a pH>5.5, naturally occurring aluminum compounds exist predominantly in an undissolved form such as gibbsite, $Al(OH)_3$, or aluminosilicates. Although some exceptions can occur in the presence of high amounts of dissolved organic material, these forms of aluminum are not in a form which will cause aquatic life impairment.

The toxicological profile also outlines study results conducted by Goenaga and Williams (1988), that, in general, decreasing the water pH (acidification) results in an increase in mobility of the monomeric (toxic) forms of aluminum. The predominant form at pH<4 is the hydrated trivalent aluminum ion. Between pH of 5 and 6, the predominant forms are $Al(OH)^{+2}$ and $Al(OH)_2^{+}$, while the solid $AL(OH)_3$ is most prevalent between pH 5.2 and 8.8 (Martell and Motekaitis 1989). The soluble species $Al(OH)_4^{-}$ is the predominant species above pH 9 and the only species above pH 10.

All available data indicates that bioavailable forms of aluminum at low pH can be toxic; however, aluminum is generally not going to be present in a toxic or bioavailable form in waters that are not violating the State's water quality standards for pH.

V. OTHER STATE'S ALUMINUM CRITERIA

The Board is often interested in the actions of other states with regard to particular criteria. Based on a survey of the states surrounding West Virginia and the EPA Region III states (collectively, Pennsylvania, Ohio, Kentucky, Virginia, Maryland, Delaware, and Washington, D.C.), only Pennsylvania and Delaware have adopted aluminum criteria. Delaware has adopted criteria of 87 µg/l total aluminum for chronic exposures and 750 µg/l for acute exposures. Pennsylvania has adopted a criterion of 750 µg/l for chronic exposures.

Importantly, Pennsylvania formally rejected the chronic criterion of 87 µg/l in 1999 because of the flawed science on which it is based. In 2001, EPA accepted Pennsylvania's rejection of the chronic criterion, stating specifically:

> Aluminum is considered a non-priority pollutant by EPA, and on that basis and the basis that EPA Region III recognizes the uncertainty surrounding the chronic aquatic life criteria, we will not recommend to the Administrator that she use her discretionary authority and promulgate the chronic aluminum aquatic life criterion at this time.

Copies of Pennsylvania's rationale for rejecting the chronic criterion and EPA's letter approving Pennsylvania's action are provided in Attachment H.

VI. STREAM DATA

As mentioned previously, DEP's 2004 Draft Section 303(d) List includes 166 waters, comprising 2,090 stream miles, that are considered impaired pursuant to the chronic aluminum criteria. As presented to the Board in its past consideration of the aluminum criteria, many of the listed streams have thriving aquatic communities and have no physical signs of impairment.

A summary of the data used for select listed streams on the draft 303(d) list is provided in Attachment I. The North Fork of the Cherry River, Cranberry River, Williams River, Cacapon River, Cheat River, Greenbrier River, and Opequon River are all listed on the draft 303(d) list because the dissolved aluminum concentrations exceed the chronic aluminum criterion. Yet all of these streams have a dissolved aluminum concentration below the 292 µg/l concentration determined to not cause toxicity in the cited brook trout or striped bass studies.

These streams have thriving aquatic communities. DEP has extensive benthic studies demonstrating the health of the aquatic systems. In addition, detailed fish studies have been performed on the Cheat River watershed. This data shows little correlation between aluminum concentration and fish population. *See* Attachment J, which is a scatter diagram prepared by Dr. Todd Petty, Assistant Professor of Fisheries, WVU, based on Index of Biologic Integrity ("IBI") scores and dissolved aluminum data for streams in the Cheat River watershed. As stated previously, this 303(d) listing will require DEP to prepare a

TMDL for these streams, despite their thriving aquatic communities. Clearly, this will detract from DEP's ability to use its limited resources for developing TMDLs on streams with actual impairment.

Importantly, the majority of streams in the State have much higher calcium concentrations and hardness than used in the toxicity studies for brook trout and striped bass. Calcium and hardness have been demonstrated to ameliorate the effect of aluminum in low pH waters. Calcium has been demonstrated to reduce the loss of other salts which are essential to maintaining sodium and potassium levels in fish. Sodium and potassium are the most important salts in fish blood. They are integral to normal heart, nerve and muscle function. Many of the toxicity studies performed on brook trout and striped bass were performed in extremely soft water ($\leq$25 mg/l $CaCO_3$). DEP has collected extensive data for streams across the State as part of its monitoring network. A summary of data for streams with dissolved aluminum concentrations greater than 75 µg/l is provided in Attachment K.[2] The summary contains more than 350 streams which have at least one dissolved aluminum concentration above 87 µg/l. Only 48 of these streams on the summary list have calcium concentrations <10 mg/l or a calculated hardness less than 25 mg/l $CaCO_3$.

About half of the streams in the summary with dissolved aluminum concentrations above 87 µg/l are in compliance with West Virginia's pH criteria. The effect of aluminum is dependent on the pH of the stream. The recent toxicity studies on aluminum have demonstrated that aluminum exacerbates the stress of low pH on the aquatic environment. The streams with pH<6 are already out of compliance with the pH criteria and therefore must be considered for 303(d) listing regardless of the aluminum concentrations.

Importantly, the aluminum included in the dissolved aluminum measurement may not actually be dissolved. The EPA method for analysis of dissolved aluminum utilizes

[2] DEP is in the process of compiling a summary of stream data relevant to aluminum. Only a portion of this dataset was available for the preparation of this document by the Industry Groups. Therefore, the data to be provided to the Board by DEP is incorporated herein by reference. The Industry Groups will review the full DEP dataset once it is available and prepare a similar summary of the information.

a 0.45 μm filter, while the brook trout study cited in the criteria document used a 0.1 um filter. Small suspended and colloidal particles are capable of passing through a 0.45 μm filter. While the Board has historically taken the position that compliance with water quality standards should be based upon an EPA-approved method, the difference in filter size clearly affects the comparability of sampling results in the toxicity studies cited in the EPA Rationale Document and the DEP stream sampling results used in the draft 303(d) list.

Extensive review of stream data was also performed as part of the 1999 review of the aluminum criteria. Summaries of this data review are provided in Attachment L. The data review indicated that streams with concentrations of dissolved aluminum above 750 μg/l tend to have impaired aquatic communities, and that **elevated dissolved aluminum concentrations above 750 μg/l were encountered exclusively in streams with pH<6 and which therefore violate the State's water quality criteria for pH.** Only 3% of the 204 total streams analyzed had dissolved aluminum concentrations in excess of 87 μg/l which could not be attributable to a low pH.

VII. RATIONALE FOR PROPOSED CHRONIC ALUMINUM CRITERION

As set forth in the history on pages 3 to 5 herein, the Board deleted the chronic criterion in 1997 due to the bad science on which it is based. However, the Board failed to provide EPA with a scientific justification for the deletion of the chronic aluminum criterion. Instead, the Board's rationale document simply cites data which indicates the large number of streams in West Virginia which violate the aluminum criteria due to naturally occurring concentrations of aluminum. *See* Attachment A. EPA rejected the deletion of the chronic aluminum criterion because "West Virginia has not provided EPA with a scientific rationale to support the removal of the aquatic life chronic criterion for aluminum." *See* Enclosure 2, page 3, to EPA's letter dated June 22, 1999, provided in Attachment M.

The Industry Groups recommend that Board retain the current acute criterion and adopt a chronic criterion of 750 μg/l. This is justified based on the Final Chronic Value

calculated in the Criteria Document and the rejection of the brook trout and striped bass studies used to lower the chronic criterion to 87 µg/l.

The aluminum criteria should remain as dissolved concentrations. In 1999, the Board established to the satisfaction of EPA Region III that studies conducted in both the laboratory and in the field clearly demonstrate that the dissolved aluminum fraction is the toxic portion and that the particulate associated forms of aluminum are regarded as nontoxic. Thus, the most scientifically defensible alternative is to regulate only the dissolved (bioavailable) form of aluminum by establishing dissolved criteria.

References

Gensemer, R.W. and Playle, R.C. The Bioavailability and Toxicity of Aluminum in Aquatic Environments. Critical Reviews in Environmental Science and Technology. 29(4):315-450, 1999.

Gensemer, R.W. ,R.C. Playle, W.A. Stubblefield and J.R. Hockett. 1999. Aluminum Bioavailability and Toxicity to Freshwater Biota at Circumneutral and Higher pH. 20th Annual Meeting of Society of Environmental Chemistry and Toxicology. Philadelphia

Goenaga X, Williams DJA. 1988. Aluminum speciation is surface waters from a Welsh upland area. Environ. Pollut. 52:131-149.

Lyderson, E., S. Oxnevad, K. Ostybe, R.A. Anderson, F. Bjerkely, L. A. Vollestad and A.B.S. Poleo. 2002. The Effect of Ionic Strength on the Toxicity of Aluminum to Atlantic Salmon (*Salmo salar)* Under Non-Steady State Chemical Conditions. J. Linmology, 61(1): 69-76.

Martell A. E., Mortekaitis R.J. 1989. Coordination chemistry and speciation of Al (III) in aqueous solution. In: Lewis T.E. ed. Environmental chemistry and toxicology of aluminum. Chelsea, MI: Lewis Publishers, Inc.

Muniz, I.P. and Leivstad, H. 1980. Acidification – effects on freshwater fish. In: Ecological Impact of Acid Precipitation: Proceedings of an International Conference, Sandfjord, Norway, March 11-14, 1980, pp. 84-92.

National Acid Precipitation Assessment Program, State of Science and Technology, Vol. II, 1990.

US Department of Health and Human Services, Agency for Toxic Substances and Disease Registry, Toxicological Profile for Aluminum, July 1999.

Wigington, P.J., Jr., et al. 1996. Episodic Acidification of Small Streams in the Northeastern United States: Episodic Response Project. Ecological Applications, 6(2):374-388, 1996.

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

October 14, 2005

Triennial Review Comments

Attachment "C"

Rationale Document
46 CSR 1
Requirements Governing Water Quality Standards
Addendum, July 7, 1998

The following narrative is an explanation for the decision by the Environmental Quality Board to remove the chronic aluminum criterion for the protection of aquatic life from the Appendix E of the water quality standards rule, 46 CSR 1.

During the preliminary comment period on the triennial review, the Board received requests for removal of the chronic aquatic life criterion for aluminum from a number of interested parties, including the Office of Water Resources of the WV Division of Environmental Protection (OWR), WV Manufacturers Association, WV Chamber of Commerce and American Electric Power Company. Upon review of those requests and after holding a public meeting to discuss the issue, the Board recommended the removal of the chronic aquatic life value for aluminum.

Several factors were considered by the Board in making this recommendation. First, water quality data collected by the OWR throughout the state indicates that the chronic aluminum value is exceeded in numerous streams in many counties in the state. In spite of these exceedences, however, the streams appear to support healthy populations of aquatic life.

The source of the relatively high background concentrations is not known with certainty at this time. Some contributions are suspected to be the result of surface runoff due to aluminum being leached from soil. However point source discharges, including water treatment facilities, are likely resulting in significant contributions as well.

One of the primary concerns voiced by the OWR is that the high background values foreclose the possibility of new discharges of aluminum on these streams which are exeeding the chronic value of 87 ug/l. The OWR has denied discharge limits for aluminum for water treatment facilities proposing to use alum, due to the potential aluminum discharges. The OWR has also expressed concern that many of these streams may have to be placed on the 303(d) list which will trigger a number of potential state and federal actions, again, without evidence of harm to aquatic life. The Board's goal is ensuring the protection of the waters of the state, but in this case, there is no definitive evidence that the existing background concentrations are causing harm to the resident populations of aquatic life in the affected streams.

The Board, therefore chose to address the concerns by removing the chronic value, but did so after reaching an agreement with the staff of OWR that over the next year, the watershed assessment team would collect instream aluminum data (dissolved and total concentrations) and conduct surveys of aquatic life in streams throughout the state in order to assess the impact of these aluminum concentrations on the aquatic life. It is the Boards' intent to review that data, with the assistance of the OWR and EPA, and revisit the removal of the chronic aluminum

criterion in light of the findings.

An additional consideration in the Board's decision is our understanding that EPA is currently reviewing the existing chronic aluminum value may change the criterion as a result of that review. In informal discussions with several EPA staff members, we have been advised that the 87 ug/l chronic value may be overprotective and that the acute value is probably protective in most circumstances.

We intend to continue to work with the staff at the Region 3 office on this issue. We will forward all of the aluminum and benthic data we receive from the OWR and will continue to consult Region 3 staff regarding any findings made by your agency in its review of the criterion.

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

October 14, 2005

Triennial Review Comments

Attachment "D"

RULES AND REGULATIONS

Title 25--ENVIRONMENTAL PROTECTION

ENVIRONMENTAL QUALITY BOARD

[25 PA. CODE CHS. 92, 93 AND 95--97]

Water Quality

[30 Pa.B. 6059]

The Environmental Quality Board (Board) is amending Chapters 92, 93, 95 and 97, and adding new Chapter 96, as set forth in Annex A. This notice is given under Board order at its meeting of June 20, 2000.

A. *Effective Date*

These amendments will be effective upon publication in the *Pennsylvania Bulletin* as final rulemaking.

B. *Contact Persons*

For further information on Chapters 92 and 97 (relating to National Pollutant Discharge Elimination System; and industrial wastes), contact Milton Lauch, Chief, Division of Wastewater Management, Bureau of Water Quality Management, 11th Floor, Rachel Carson State Office Building, P. O. Box 8465, Harrisburg, PA 17105-8465, (717) 787-8184, or William J. Gerlach and William S. Cummings, Jr., Assistant Counsels, Bureau of Regulatory Counsel, 9th Floor, Rachel Carson State Office Building, P. O. Box 8464, Harrisburg, PA 17105-8464, (717) 787-7060.

For further information on Chapters 93, 95 and 96 (relating to water quality standards; wastewater treatment requirements; and water quality standards implementation), contact Edward R. Brezina, Chief, Division of Water Quality Assessment and Standards, Bureau of Watershed Conservation, 10th Floor, Rachel Carson State Office Building, P. O. Box 8555, Harrisburg, PA 17105-8555, (717) 787-9637 or William J. Gerlach, Assistant Counsel, Bureau of Regulatory Counsel, 9th Floor, Rachel Carson State Office Building, P. O. Box 8464, Harrisburg, PA 17105-8464, (717) 787-7060.

Persons with a disability may use the AT&T Relay Service by calling (800) 654-5984 (TDD users) or (800) 654-5988 (voice users) and request that the call be relayed. These final-form regulations are available electronically through the Department of Environmental

Protection's (Department) website (http://www.dep.state.pa.us).

C. *Statutory Authority*

These amendments are made under the authority of the following acts: sections 5(b)(1) and 402 of The Clean Streams Law (35 P. S. §§ 691.5(b)(1) and 691.402) and section 1920-A of The Administrative Code of 1929 (71 P. S. § 510- 20), which grant to the Board the authority to develop and adopt rules and regulations to implement the provisions of The Clean Streams Law (35 P. S. §§ 691.1--691.1001).

D. *Background and Summary*

This final rulemaking revises water quality management regulations including Chapters 92, 93, 95 and 97, and creates a new Chapter 96 to incorporate Total Maximum Daily Loads (TMDLs) into the regulatory calculus, all as part of the Regulatory Basics Initiative (RBI). The RBI is a multistep process to evaluate regulations considering several factors including whether requirements are more stringent than Federal regulations without good reason; impose economic costs disproportionate to the environmental benefit; are prescriptive rather than performance-based; inhibit green technology and pollution prevention strategies; are obsolete or redundant; lack clarity; or are written in a way that causes significant noncompliance.

These regulatory revisions streamline and clarify regulatory requirements, update the regulations to be consistent with Federal regulatory changes where indicated, consolidate certain chapters, and preserve Pennsylvania-specific requirements to serve the citizens of this Commonwealth. These final-form regulations may affect persons who discharge wastewater into surface waters of this Commonwealth or otherwise conduct activities which may impact these waters.

The Air and Water Quality Technical Advisory Committee (AWQTAC) and its successor committee, the Water Resources Advisory Committee (WRAC), provided input on the proposed amendments. The proposal was adopted by the Board as proposed rulemaking at its June 16, 1998, meeting. The proposal appeared at 28 Pa.B. 4431 (August 29, 1998), with provisions for a 60-day public comment period and three public hearings. The public comment period concluded on October 28, 1998. In response to the public comments received on the proposal, the Department revised the proposal in the form of an Advance Notice of Final Rulemaking (ANFR) proposal. Notice of the availability of the ANFR appeared at 29 Pa.B. 4872 (September 18, 1999) with provisions for a public comment period open until November 17, 1999, and three public meetings/hearings. The Department received approximately 1,500 public comments on the ANFR. The comments received on the proposed regulations and on the draft final regulations are summarized in Section E of the Preamble.

The Board has considered all of the public comments received on both its proposed rulemaking and the Department's ANFR in preparing these final-form regulations. Those portions of the draft final-form regulations that would potentially affect agriculture were presented to the Agricultural Advisory Board (AAB) on February 16, 2000. Following the meeting, the AAB sent a letter to Secretary Seif in opposition to the existing regulatory requirements concerning public hearings for individual NPDES permit applications for existing concentrated animal feeding operations (CAFOs) in High Quality and Exceptional

Value Waters. The draft final-form regulations were discussed with and approved by WRAC on March 8, 2000. WRAC also submitted minutes of its meeting to document its comments on the regulations. The valuable input from the public and the collective knowledge and experience drawn from advisory committees and others on these proposals has been utilized to develop a regulation which carefully balances the needs of citizens and the regulated community in assuring the protection of this Commonwealth's waters.

E. *Summary of Comments and Responses on the Proposed Rulemaking and the ANFR*

These regulatory revisions streamline, clarify and consolidate the regulatory requirements. Specifically, Chapter 92 has been modified to incorporate portions from other chapters to address the permitting of wastewater discharges into surface waters. The water quality standards implementation provisions in Chapter 93 and portions of Chapter 95 are moved to Chapters 96 and 92, as appropriate. Chapter 96 incorporates existing and modified provisions of Chapters 93, 95 and 97, and includes language describing TMDLs and individual water quality-based effluent limitations. The provisions of Chapter 97 have been relocated to Chapters 92, 95 and 96.

The preamble to the proposed rulemaking asked for comment on three specific issues. 1) A few comments were received on the question of additional public participation for NPDES permitting. The comments were split on the issue, and no change has been made to the current requirements. 2) The question of whether or not the potable water supply use should continue to be a Statewide use, or if it should be changed so that applicable water quality criteria are only applied at existing or planned potable water supply intakes, received several comments on both sides. Some comments stated that additional burdens were placed on dischargers to meet criteria more stringent than necessary, and other comments believed that protection of human health and water supplies were the most important factors in the decision. Based on an analysis of public comments and on the basis that the potable water supply use has been protected Statewide for many years and will impose no new requirements on dischargers, no change is being made to the potable water supply use, and the current language is retained. 3) No one commented on the request seeking alternative methods of analysis for color.

Because portions of this regulatory package constitute the Triennial Review of Water Quality Standards mandated by Envirnomental Protection Agency (EPA) regulations in 40 CFR Part 131 (relating to water quality standards), the following considerations were made. Part of the review requires that states reexamine waterbody segments that do not meet the fishable or swimmable uses specified in section 101(a)(2) of the Federal Clean Water Act (33 U.S.C.A. § 1251(a)(2)). The Department evaluated the two waterbodies where the uses are not met: (1) the Harbor Basin and entrance channel to Outer Erie Harbor/ Presque Isle Bay and (2) several zones in the Delaware Estuary.

The swimmable use designation was deleted from the Harbor Basin and entrance channel demarcated by United States Coast Guard buoys and channel markers on Outer Erie Harbor/Presque Isle Bay because boat and shipping traffic pose a serious safety hazard in this area. This decision was based on a use attainability study in 1985. Because the same conditions exist today, no change to the designated use for Outer Erie Harbor/Presque Isle Bay is made.

The Department cooperated with the Delaware River Basin Commission (DRBC), EPA and other DRBC signatory states on a comprehensive use attainability study in the lower

Delaware River and Delaware Estuary. This study resulted in appropriate recommendations relating to the swimmable use, which the DRBC included in water use classifications and water quality criteria for portions of the tidal Delaware River in May 1991. Criteria for enterococcus and changes in application to the fecal coliform criteria in this area reflect the use. The changes were incorporated into §§ 93.9e and 93.9g (relating to Drainage Lists E and G) in 1994. The primary water contact use remains excluded from the designated uses for river miles 108.4 to 81.8 because of continuing significant impacts from combined sewer overflows.

The Department is also incorporating §§ 92.8a(c), 92.13(b), 92.21(b)(5) and 92.55 into its water quality standards. This clarifies the Department's ability to incorporate schedules of compliance in NPDES permits when a Federal statutory deadline has passed pursuant to the decision in *In the Matter of Star-Kist Caribe, Inc.*, NPDES Appeal No. 88-5, 1990 NPDES LEXIS 4 (April 16, 1990).

In addition, an error in § 93.9p (relating to Drainage List P) for Tunungwant Creek in McKean County, which states that the water contact sport use (WC) should be deleted for the main stem portion from the confluence of the East and West Branches to the PA-NY State border, has been corrected. The Department conducted a use attainability study for Tunungwant Creek in 1985 and concluded that, while there were existing land use and man-made activities adversely affecting the quality of water and limiting recreational uses in the stream, these man-induced conditions were not considered irretrievable. Accordingly, the water contact sports use was added as a designated use to Tunungwant Creek at the November 15, 1988, Board meeting, and this final-form rulemaking was published at 17 Pa.B. 968 (March 11, 1989). This regulatory revision was not, however, incorporated into the *Pennsylvania Code* until now.

A detailed description of the revisions to the proposal by chapter and section follows:

General

Many comments objected that the proposal weakened water quality protection in this Commonwealth and that the comment period was insufficient to address the wide scope of changes. In response, the Department prepared an ANFR and offered an additional comment period and a series of three public informational meetings and public hearings. The change of most concern in Chapter 92 was § 92.81(a)(5) (relating to toxic or hazardous pollutants and general NPDES permits). In response to comments, the current language of the section, prohibiting the use of general NPDES permits in High Quality and Exceptional Value Waters, is retained.

Other comments suggested that the Department should make its water quality standards more stringent than Federal regulations or as stringent as practicable. The RBI only allows for more stringent standards when a compelling state interest is established.

A commentator stated that State regulations cannot become effective until receipt of EPA approval, based on a Federal case in Alaska. First, this case applied only to water quality standards, and not other State regulations which regulate water quality in some way, such as implementation regulations. Moreover, the Commonwealth has the duty and obligation under State statutes to promulgate and implement regulations, including water quality standards regulations, to protect this Commonwealth's water quality regardless of Federal

action, delay or inaction. The revisions to the Federal regulations which became final on April 27, 2000 (64 Fed. Reg. 37072) only apply to water quality standards "for Clean Water Act" (CWA) purposes. The Commonwealth will continue to issue NPDES permits based on the best available scientific information in its water quality standards, which may or may not be included in a water quality standards regulation approved by the EPA for CWA purposes. The Department, not the EPA, must defend the permits it issues in this Commonwealth, and has an obligation to apply applicable State water quality standards regulations in issuing the permits. The EPA has the legal right to object to an NPDES permit if they believe the state water quality standard used as a basis for the permit limit is insufficient for CWA purposes.

Concern was expressed that the public comment period was insufficient. The Department provided an additional 60-day public comment period following the 30-day comment period to obtain additional input on the regulations. Over 300 commentators took advantage of the extended comment period.

Chapter 92. National Pollutant Discharge Elimination System

The provisions of this chapter incorporate by reference portions of Federal regulations. This was done to limit the verbatim transfer of lengthy Federal regulations into this chapter. For this reason, it may be necessary for permittees to refer to Chapter 92 and 40 CFR Parts 122, 124 and 125 (relating to EPA administered permit programs: the National Pollutant Discharge Elimination System; procedures for decisionmaking; and criteria and standards for the National Pollutant Discharge Elimination System) to determine applicable requirements.

§ 92.1. Definitions.

The following definitions contained in the proposal were deleted in the final-form regulations: "average annual discharge limitation," "average monthly discharge limitation," "average weekly discharge limitation," "bypass," "complete application," "LA-Load allocation," "loading capacity," "major facility," "natural quality," "operator," "owner," "separate storm sewer overflow," "TMDL" and "WLA-Wasteload allocation." Deletions were based on comments received regarding the need for or clarity of these definitions.

Definitions for "agricultural operation," "AEU--animal equivalent unit (AEU)," "CAO--concentrated animal operation," "indirect discharger," "intermittent stream," "perennial stream" and "small municipal separate storm sewer system" were added and the proposed definition of "CAFO--concentrated animal feeding operation" was modified based on comments recommending that the Department's CAFO Strategy be incorporated in the final-form regulations.

Commentators recommended that a number of definitions be modified to be more consistent with Federal definitions. A number of definitions were modified in the final rule as follows:

The definition of "BAT--Best available technology" was modified to make the definition more consistent with the Federal definition.

The definition of "BMPs--Best Management Practices" was modified by deleting the

phrase "pollution prevention measures; source reduction procedures; water conservation practices; erosion and sedimentation control plans, stormwater management measures; and" to be more consistent with the Federal definition.

The definition of "conventional pollutant" has been modified by deleting "nitrites, nitrate nitrogen and phosphorous" to make the definition consistent with the Federal definition.

The term "facility or activity" is modified to be consistent with the Federal definition.

The word "used" has been deleted from the definition of "effluent limitation guideline" to make the definition consistent with the Federal definition.

The eight permit categories listed within the definition of "point source" were deleted to simplify the definition. The word "or" was deleted and "and" inserted in lieu thereof to make the definition more consistent with the Federal definition.

Commentators proposed revisions to definitions for clarity. The following changes were made to definitions in the final-form regulations:

The definition of "CCW--Contact cooling water" was amended by deleting the phrase ", or which otherwise has the potential to become contaminated" because it was unclear.

The definition of "CSO--Combined sewer overflow" was amended to make it clear that these overflows occur "prior to reaching the headworks of the sewage treatment facility."

Definitions for "intermittent stream" and "perennial stream" were added because these terms are used in the definition of surface waters.

The definition of "NPDES reporting form" is clarified by deleting "which includes" from the definition and adding "and" in lieu thereof.

The last sentence in the definition of "process wastewater" was deleted as unnecessary.

The definition of "stormwater discharges associated with construction activities" was revised to provide consistency with the definition of "NPDES permit for stormwater discharges associated with construction activities" in § 102.1 (relating to definitions).

Recommended changes to the definitions of "best available technology," "applicable effluent limitations" and "toxic pollutant" were not made because the definitions are based on Federal definitions.

§ 92.2. Incorporation of Federal regulations by reference.

A commentator stated that incorporation of Federal regulations by reference violates State law. This practice is not a violation of any State law and has been done before.

In response to comments requesting clarity, the last sentence of § 92.2(a) (relating to incorporation of Federal regulations by reference) has been deleted and new language added to clarify that if there is a conflict among Federal and State regulatory provisions, the provision in Chapter 92 shall be used unless the Federal provision is more stringent.

A typographical error was corrected by changing "(h)(1)" to "(h), (i)(2), (j), (k), (l)" in subsection (b)(5).

In response to comments received, subsection (b)(6) was deleted in the final-form regulations to incorporate the Department's CAFO Strategy into the regulations. The Federal references are inconsistent with the strategy.

Several commentators suggested sections of the Federal regulations that should have been incorporated by reference because they are not addressed in Chapter 92. Subsection (b)(19), (22) and (23) was added in the final-form regulations to identify these additional Federal provisions incorporated by reference.

Commentators questioned the meaning of the qualifying term "substantive and procedural." Subsection (c) was amended in the final-form regulations by deleting the words "substantive or procedural" to make the section more clear.

§ 92.2a. Treatment requirements.

Subsection (a) was modified in the final-form regulations by deleting the last sentence limiting treatment requirements and effluent limits to those established under the Federal Clean Water Act (33 U.S.C.A. §§ 1251--1376).

Commentators questioned the protection of threatened species not yet listed in the Pennsylvania Natural Diversity Inventory but included on Federal listings. The reference to the "Pennsylvania Natural Diversity Inventory" (PNDI) in subsection (c) has been deleted to allow for consideration of threatened species not yet included on that list, but established as threatened when someone identifies and documents the presence of these to the Department. The PNDI will still be used as the source of information for threatened species in this Commonwealth.

§ 92.2b. Pollution prevention.

The proposed pollution prevention amendments were deleted based on comments questioning the inclusion of guidelines that are not regulatory requirements, and the potential for these recommendations to take on regulatory meaning. This section was revised to provide that the Department will encourage pollution prevention and provide assistance to permittees in the consideration of pollution prevention measures. Comments were received opposing this change during the ANFR comment period. Commentators stated that the change weakened the regulations. The changes to this section proposed during the ANFR were retained in the final-form regulations. The Department believes that the regulations should place the burden of encouraging pollution prevention on the Department and that this program functions best when a voluntary approach is used. Recommendations related to pollution prevention activities for permittees are not appropriate for regulation. The language in this section is based on language in recent revisions to Chapter 91 that became effective on January 29, 2000. See 30 Pa.B. 521 (January 29, 2000).

§ 92.2c. Minimum Sewage and Industrial Waste Treatment Requirement.

Subsection (a) was modified to specify that secondary treatment is applicable to all

sewage discharges, except sanitary sewer overflows (SSOs) which are prohibited in accordance with § 92.73(8), and combined sewer overflows (CSOs), which need not attain secondary treatment if they implement Department-approved nine minimum controls (NMCs) and a long-term control plan (LTCP).

The phrase "after direct application or encouragement of pollution prevention approaches, including in-process recycling and reuse" was deleted in subsection (b)(4) to be consistent with the changes to § 92.2b, relating to pollution prevention. Additionally, subsection (b)(4) was changed to reference and clarify the applicability of provisions for quality standards and oil-bearing wastewater to NPDES discharges.

A new subsection (c), providing a cross reference to § 95.2 (relating to quality standards and oil-bearing wastewaters) has been added to the final-form regulations. This change was not included in the proposed rulemaking.

§ 92.2d. Technology-based standards.

Paragraph (3)(i)(C) is modified in the final-form regulations by deleting the phrase "other pollution prevention approaches" to be consistent with the changes made to § 92.2b discussed previously.

Some commentators supported the retention of 0.5 mg/l effluent limitation for discharges of total residual chlorine while others felt the regulations were too stringent and suggested a lesser residual chlorine limit. Others objected to the dechlorination provisions in paragraph (3)(iii) in special protection waters. These provisions were modified in the final-form regulations as a result of terminology changes in the Department's antidegradation regulations in § 93.4c(b)(1)(iii).

There were objections to the transfer of provisions from Chapter 97 to Chapter 92 regarding oils creating a sheen. These provisions were determined to apply to both NPDES and non-NPDES discharges and were consequently moved to Chapter 95 in the final-form regulations. A reference to § 95.2 was added to paragraph (4) of the final-form regulations. Comments were received in support of this change.

§ 92.4. Exclusions from Permit Requirements.

There was a request that natural gas and oil producing activities receive a permit exemption because it was asserted that these operations are similar to agricultural and silviculture activities that have such a permit exemption. The exemptions are based on Federal regulations and they do not include oil and gas producing activities. The change was not made.

A commentator objected to the proposed pollution prevention language in subsection (a)(6). The phrase was deleted for reasons described in a response related to § 92.2b. Other clarifying changes were also made to this provision.

§ 92.5a. Concentrated animal feeding operations.

As proposed, this section would have authorized a "permit by rule" for CAFOs meeting certain requirements. The Department issued a "Final Strategy for Meeting Federal

Requirements for Controlling the Water Quality Impacts of Concentrated Animal Feeding Operations" in March 1999. A notice of the availability of that strategy was published at 29 Pa.B. 1439 (March 13, 1999). The strategy does not provide for coverage under a permit by rule. Commentators recommended incorporation of the final strategy into the regulations. Accordingly, the proposed language of § 92.5a was deleted and replaced in the final-form regulations with regulations consistent with the published strategy.

§ 92.6a. Persons required to apply.

The proposed language was supported by one commentator, while another recommended it be changed to require the person with financial control over the operation to be the permittee. This entire provision was deleted in the final-form regulations as unnecessary. The Department will continue to permit persons with point source discharges, which includes owners, operators and others, as appropriate, as it has done for many years.

§ 92.7. New or increased discharges or change of wastestreams.

The final-form regulations replace the word "director" with the word "Department" for clarity. Commentators objected to the lack of clarity of the phrase "or which would include any new pollutant not covered by the NPDES permit" at the end of the last sentence in the section as part of the ANFR. The language has been amended in the final-form regulations to more clearly limit this requirement to those pollutants not identified in a previous permit application.

§ 92.8a. Changes in treatment requirements.

The proposed pollution prevention language in the last sentences of subsections (a) and (b) has been deleted to be consistent with the changes made to § 92.2b.

A commentator asserted that the provisions of subsection (a) are violations of due process protections, more stringent than Federal regulations and beyond the power of the Department. This provision was transferred intact from two other chapters that were previously approved as to form and legality by the Office of the Attorney General. Actions taken under these provisions may be appealable to the Environmental Hearing Board (EHB). The provisions were retained in the final-form regulations.

Commentators expressed concern regarding the proposed 90-day time period to complete an extensive report. They suggested 180 days and opposed the language allowing the Department to unilaterally shorten the time frame without any regulatory restraints or procedures. Subsection (b) has been modified in the final-form regulations rule to increase the time allowed for submission of the required report from 90 to 180 days. In addition, the phrase "or within a lesser period as the Department may specify" was deleted. The last part of the following sentence was also changed to ensure consistency with a previous reference in the sentence to water quality standards by inserting the word "standards" following the phrase "water quality."

A commentator was concerned that this section did not include authority to impose permit modifications with compliance schedules. Subsection (c) was modified in the final-form regulations to add a phrase that provides the option of imposing permit modifications with compliance schedules to achieve compliance.

§ 92.11. Duration of standards for certain new sources.

A commentator suggested the more stringent standard of performance be for the lesser of 10 years or during the depreciation period. This suggested change was not made because this regulation is based on Federal regulatory requirements.

Proposed rulemaking included a deletion of the phrase "standards of performance shall" and insertion of the phrase "requirements will" in lieu thereof. The final-form regulations reestablishes the original language based on comments opposing the new language as unclear.

§ 92.13. Reissuance or renewal of permits.

With respect to subsection (a), commentators expressed concern that the Department's Money-Back Guarantee time limits are inconsistent with the regulatory permit review limits. The Money-Back Guarantee does not influence the Department's ability to process permits in a shorter time frame. No changes were made to this section.

Some commentators suggested that recent case law would require incorporation of a broad compliance review for all permitting activities. The scope of the compliance evaluation in subsection (b)(1) was expanded in the final-form regulations to include all Department issued permits, regulations and orders. A reference to other appropriate regulations was included at the end of the subsection to allow consideration of compliance schedules outside of the requirements of Chapter 92.

§ 92.21. Applications.

Some commentators requested the reinsertion of the phrase "not less than" in the final-form regulations to eliminate a perception that the proposed language required submittal at exactly 180 days. The recommended phrase has been reinserted in the final rule to provide clarity. Other commentators expressed concern that the time limits in the regulation were inconsistent with Department's Money-Back Guarantee. No change was made because the Money-Back Guarantee does not impact the Department's ability to process applications in a shorter period of time.

Based on comments received, a new paragraph (5) is added in the final-form regulations which includes a requirement for documentation that the applicant is in compliance with all existing Department permits, regulations, orders and schedules of compliance, consistent with similar changes made in § 92.13 (relating to reissuance or renewal of permits). Commentators suggested requiring the newspaper publication in subsection (b)(3) only for major modifications of the facility. No change was made because The Clean Streams Law requires this.

Subsection (c)(2) was deleted in the final-form regulations to be consistent with the revisions made to § 92.2b (relating to pollution prevention).

Comments on subsection (c) stated that some of the required information for a new facility application is generally available only after the commencement of a discharge, not when an application for a facility is being prepared. Accordingly, the provisions of subsection (c)(3)--(5) were transferred to a new subsection (d) which states that the

Department may require an applicant for a modification, renewal or reissuance of a permit under § 92.13, or when required under 40 CFR Part 122 to provide this information. In addition, proposed subsection (c)(6) is renumbered as subsection (c)(2) and proposed subsections (d)--(f) are renumbered as subsections (e)--(g).

§ 92.21a. Additional application requirements for classes of discharges.

A commentator requested that the provisions related to the determination that aquatic communities are excluded be clarified. Subsection (e) has been modified in the final-form regulations to state that water quality data confirming a lack of improvement will be the measure of the exclusion of aquatic communities.

Subsection (d) is clarified to cross reference the requirements in Chapter 102 for stormwater dischargers associated with construction activities.

Subsection (e)(2)(iii) is revised by providing a cross reference to the definition of "TMDL" in § 96.1 to provide clarity.

Proposed language in subsection (f) relating to discharges with approved pretreatment programs was deleted in the final rule. Subsections (g) and (h) of the proposal were renumbered as subsections (f) and (g) respectively.

Commentators stated that the elimination of CSOs is impossible, that the time required is too extensive to make this requirement a prerequisite to a permit renewal, that identifying all points of influent is impossible, and that elimination should only be required where the discharge will not meet water quality based effluent limitations. Subsection (f) of the final-form regulations includes provisions to allow for submitting a long-term control plan to "minimize" or "eliminate" CSO discharges. These changes are consistent with Department's published CSO Strategy. Additional revisions delete proposed subsections (g)(3)(i)--(v) and, in lieu thereof, reference a Federal publication rather than listing its content in summary in the regulations. Subparagrah (vi) was renumbered (ii) and a requirement for an implementation schedule was added to the final-form regulations (third element of an approvable CSO program). The provisions relating to the identification of points of inflow into combined sewers is retained in the final-form regulations. This activity is a necessary part of compliance with the nine minimum controls related to the minimization or elimination of CSOs.

Editorial changes were made to subsection (h) (now (g)) in the final-form regulations.

§ 92.22. Application fees.

A new subsection (f) was added to provide an exemption from permit fees for certain CAFOs consistent with the Department's CAFO Strategy. Existing subsection (f) was renumbered as (g).

§ 92.25. Incomplete applications or notice of intent.

A minor editorial change to the proposal is made. The proposal references a notice of intent "to participate in" an NPDES general permit. The phrase "participate in" is replaced with "be covered by" since that is a more accurate description of the general permit process.

§ 92.31. Effluent limitations or standards.

An editorial change was made to subsection (a). Subsection (a)(9) was added to cross reference water quality protection requirements in Chapter 96 and subsection (a)(10) was added to cross reference antidegradation requirements.

§ 92.41. Monitoring.

A number of commentators objected to the addition of proposed subsection (b), asserting that the provisions allow arbitrary requirements and time limits to be set by the Department. The proposed subsection was proposed for deletion in the ANFR. After reconsideration, this language was rewritten to eliminate those portions of the provision on which objections were received. References to requests for additional information by the Department, which were perceived as arbitrary were deleted, and provisions retained which establish monitoring and reporting requirements to be incorporated in permit documents. The last two sentences of proposed subsection (b) (relating to monitoring pollutants not limited in the permit) are deleted in the final-form regulations. Commentators asserted that these provisions were overly broad, inconsistent with Federal requirements or not in the spirit of the RBI.

The amendments to subsections (c) and (g) make it clear that the monitoring requirements of subsection (g) also apply to stormwater discharges associated with construction activities and that subsection (c) is not applicable to stormwater discharges associated with industrial activity. No comments were received on this change. The proposed change is retained in the final-form regulations.

§ 92.51. Standard conditions in permits.

Some commentators suggested that the language in proposed paragraph (6) was confusing and should be simplified to say that compliance with all water quality standards is required. The proposed subsection was clarified in the ANFR by breaking it up into two sentences. Additional comments were received asserting that the changes made the provisions less clear. The final-form regulations incorporate the provisions into a single sentence and retains language that is consistent with the intent of the original regulation. A new paragraph (7) was added to the final-form regulations in response to comments to clearly state that dischargers must comply with applicable water quality standards.

§ 92.52a. Site specific permit conditions.

The final-form regulations delete the last sentence proposing pollution prevention measures. This change is consistent with the position described in response to comments made on § 92.2b. Commentators stated that the proposed provisions were too broad and that BMPs should be established through the regulatory process. The final-form regulations includes a provision that requires permittees to identify BMPs reasonably necessary to achieve effluent limitations and standards or to carry out the purpose and intent of the Federal Act (the Clean Water Act) and to implement toxic reduction activities, effluent limitations based on WETT and other measures which eliminate or substantially reduce pollutants at their source. These final-form regulations provide the permittee with the opportunity to take an active role in establishing sufficient BMPs to achieve protection of surface waters.

§ 92.61. Public notice of permit application and public hearing.

WRAC recommended that the Department seek public comment on the need for an additional public notice when an NPDES application is renewed or when an applicant intends to apply for an NPDES permit, before an application is completed. Comments on this issue ranged from support for the notice of intent to support for no additional public notice. The Department believes the existing requirements for public notice are sufficient and no change has been made in the final-form regulations.

A new subsection (a)(9) was added to cross reference regulations promulgated at 29 Pa.B. 3720 (July 17, 1999) which provide that the notice shall include the antidegradation classification of the receiving surface water.

§ 92.71a. Transfer of permit.

Based on comments received regarding the need to include compliance evaluations as a part of permit actions, a new paragraph (4) has been added to the final-form regulations that requires compliance with all Department permits prior to approval of permit transfers.

§ 92.72a. Cessation of discharge.

Commentators stated that the 180-day notice should be reduced to 90 days to be consistent with State mandated notification requirements. The final-form regulations establishes the 90-day notification requirement.

§ 92.73. Prohibition of certain discharges.

This section is revised to provide that a permit will not be issued, modified, renewed or reissued under any of the conditions enumerated.

Paragraph (8) of the proposal provided that a permit will not be issued to a "discharger with a sanitary sewer overflow unless the discharger can demonstrate that it is taking measures to eliminate any overflows as soon as practicable, including, but not limited to a complete evaluation of the sanitary sewer system, the reduction of infiltration and inflow into the sanitary sewer system, the elimination of illegal hookups to the system, the institution of a ban or prohibition on sewer hookups to the sanitary sewer, and any other measures which will eliminate the overflows." The quoted portion of this subsection was deleted in the final rule because it is inconsistent with applicable State and Federal policy. The final-form regulations states that a permit will not be issued for a sanitary sewer overflow, except as provided for in the Federal regulations.

§ 92.81. General NPDES permits.

A large number of commentators objected to the proposed revisions to subsection (a)(5) because of a perception that this provision would allow discharge of toxic substances under a general permit. While the Department had no such intent when these amendments were drafted, the existing language prohibiting issuance of an NPDES general permit for the discharges has been reinstated in the final-form regulations.

Subsection (a)(8) of the proposal would have authorized issuance of a general permit for

discharges to High Quality Waters, but not to Exceptional Value Waters. A large number of commentators objected to this provision at proposed rulemaking. Accordingly, as part of the ANFR it was proposed to reinstate existing language that prohibits the issuance of general NPDES permits for activities in High Quality Waters. In response to the ANFR, the Department received a very large number of comments on both sides of this issue. The final-form regulations retain the reinstated (or existing) language prohibiting the issuance of general permits in High Quality Waters. This provision supports the Department's overriding State interest in the protection of High Quality Waters and in the provision of a broad opportunity for public comment when permit applications are received for facilities proposed in these watersheds. In addition, a recently developed individual NPDES permit for existing CAFOs in High Quality Waters clearly demonstrates the ability to create a simplified permit application process under the individual NPDES regulations while protecting the environment. A conforming change was made in § 92.83(b)(9) (relating to denial of coverage under a general NPDES permit).

The Board received comments objecting to the proposed deletion of a provision that general NPDES permits are to comply with of §§ 92.59 and 92.83(a)(1) (relating to documentation of permit conditions; and inclusion of individual discharges in general NPDES permits) that dischargers "certify" rather than "demonstrate" that the discharge will not result in a violation of an applicable water quality standard. Accordingly, the reference to § 92.59 was reinstated in § 92.81(b) and the existing term "demonstrate" reinserted in lieu of "certify" in § 92.83(a)(1) in the final-form regulations.

Some commentators opposed the proposed revisions to subsections (c) and (d) because they believed some of the options eliminated the opportunity for public comment. Two subsections proposed the inclusion of language from the Federal regulations that would have allowed discharges to commence: (1) on a date specified in the general permit; and (2) upon receipt of the notice of intent by the Department. These proposals have been deleted in the final-form regulations because they create circumstances that would make it impossible for the Department to keep a record of these discharges and they would have provided no opportunity for public comment. In addition, the proposal provided that a discharge under a general NPDES permit would be authorized after a waiting period specified in the general permit. This provision is retained, but clarifying language is added stating that the discharge may only commence following receipt of a Notice of Intent (NOI) by the Department. In addition, the provision authorizing the commencement of discharges "upon receipt of the notification of inclusion by the Department" is revised in the final rule to provide that the discharge may commence upon receipt of notification of approval of coverage under the general NPDES permit from the Department. Subsection (d) of the proposal relating to when an NOI would not be required was deleted in the final-form regulations for the same reasons outlined. Proposed subsection (e) was renumbered as subsection (d).

Commentators questioned the need for proposed subsection (e). This section was modified as subsection (d) in the final-from regulations to provide that the Department "will" notify a discharger that it is "or is not" covered under a general NPDES permit. In addition, the clause, "even if the discharger has not submitted a notice of intent to be covered" was deleted.

§ 92.83. Inclusion of individual dischargers in general NPDES permits.

Subsection (a)(3)(iii) has been deleted because it would have, consistent with the approach allowed under the Federal regulations, authorized the Department to provide no

public notice of applications for general permits or approvals of coverage. This provision was not carried forward in the final-form regulations because it did not allow for sufficient public notice. Subsection (a)(1) was amended to clarify applicable requirements for NOIs.

A number of commentators commented that the EHB recently issued a ruling stating that compliance history review is not limited to prior NPDES permits, but to all permits issued by the Department. A commentator also asserted that the list of items to be considered was inconsistent with The Clean Streams Law. Accordingly, subsection (b) was revised to include violations of Department-issued permit as grounds for denial of the general permit coverage and to reference the entire list of items to be considered under The Clean Streams Law. The remainder of the subsection was renumbered.

§ 92.92. Method of seeking civil penalty.

A commentator objected to the regulation on the basis that it removes a right to a prehearing for alleged violations. A discussion of the due process protections provided by the procedures established in the regulation is provided in the comment and response document.

§ 92.93. Procedure for civil penalty assessments.

There were several comments requesting clarifying language regarding delivery of notices, the specifics of the hearing procedure, the scheduling of hearings, posting notice, and provision of notice from the Department concerning EHB rules of practice. A change was made in the final rule to subsection (c) regarding the posting of notice. An explanation is provided in the comment and response document regarding the remaining comments.

Also in subsection (c), a clause is added clarifying that a person requesting a hearing has a right to be represented by counsel, and a change is made providing that the Department need not make a decision at the hearing.

§ 92.94. Disbursement of funds pending resolution of appeal.

Subsection (a) of the final-form regulations has been modified to replace the word "law" with "section 605 of The Clean Streams Law (35 P. S. § 691.605)."

A commentator stated that preclusion of permit issuance should only be imposed on a specific facility when a company has more than one facility in this Commonwealth. This provision is not mandatory and would be imposed only when there is a continued pattern of failure to pay final assessments. No change was made in the final-form regulations.

Chapter 93. Water Quality Standards

Section 93.4. Statewide water uses.

WWF (warm water fishes) has been reinserted in Table 2 as the default aquatic life protection because several comments made the point that there would be no default aquatic life protection of waters inadvertently not listed in the chapter.

Many comments addressed the question of retaining the Statewide potable water supply

use, some offering distinct reasons why it should be eliminated, but many others expressing support for keeping it. The use is retained without change.

A few comments suggested that the aesthetic water quality criteria for manganese and dissolved iron be applied at the point of potable water intake, as are other aesthetic criteria, under § 96.3 (relating to general water quality). The Department will analyze the impacts/benefits of this issue as part of its next triennial review of water quality standards.

A few comments were directed toward the Department adopting amended wildlife protection and protection of hydrologic regimes and habitat. At this time, there is no National guidance to assist the Department in moving forward with changes to wildlife protection. The Department is working with the Fish and Boat Commission on new habitat and stream flow criteria development, but it is premature to make changes at this time. These issues are all likely to be considered in future water quality standards reviews.

Section 93.7. Specific water quality criteria.

Comments concerning Table 3 included the following:

Alkalinity--The site-specific exception to the alkalinity criterion was reinserted because it was noted that many of this Commonwealth's streams may naturally violate the criterion, and without the exception, there would have to be regulation changes made for a very large number of site-specific criteria to amend the listings in §§ 93.9a--93.9z if the language were removed.

Aluminum--In the proposal, the aluminum criterion was amended and moved to Table 1, Chapter 16--Water Quality Toxics Management Strategy--Statement of Policy, where other water quality criteria for toxics are listed. The EPA and others commented that there was not adequate justification for the Commonwealth to not also adopt the chronic criterion. The Department believes that the chronic criterion of 87 μg/l should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies. The chronic studies described in the EPA's 1988 Ambient Water Quality Criteria for Aluminum document do not show a consistent pattern of toxicological response to the different exposure concentrations within or between the various tests described. The final chronic value developed following the EPA's procedures and based on available acute-chronic ratios is 750 μg/l, the same value as the acute criterion. However, the EPA then lowered the final chronic value to 87 μg/l, claiming it to be necessary to protect brook trout and striped bass. The EPA's justification for this adjustment was data derived from studies that the EPA later described as data that should not be used in the criteria development. The EPA staff have agreed that the aluminum toxicity is very complex due, in part, to the complexity of its chemistry and interactions with local water quality conditions and biological community. The EPA also agrees that the studies that were used in driving the derivation of the chronic criterion are limited in their application and should receive additional review. The Department cannot adopt the flawed chronic criterion for use in this Commonwealth without better justification. As recently as December 1999, the EPA reiterated that aluminum criteria issues are not a priority for the agency. Therefore, the Department believes that aluminum toxicity to fish and aquatic life will be adequately managed using the acute criterion of 750 μg/l. The Department will also continue to monitor the scientific literature and the EPA's evaluations of aluminum toxicity and amend the criterion or add a chronic criterion, if indicated. The criterion is unchanged from the proposal.

Ammonia--The ammonia criteria is not changed to match the new the EPA criteria finalized in December 1999, but will be considered in the next Triennial Review.

Bacteria--In response to an EPA comment, language is added to Bac1 which limits to no more than 10% the samples that may exceed 400 fecal coliform per 100 ml in a 30-day period for the criteria to be attained.

DO (dissolved oxygen)--The language for DO_3 (for trout stocking fishes (TSF)) is clarified to state that the criteria for lakes, ponds and impoundments apply to the epilimnion in response to a comment.

Phenolics--To respond to comments expressing concern for protecting water supplies, the Statewide criterion for phenolics (Phen - 0.005 mg/l) is retained. This criterion is applied under new § 96.3(d).

Temperature--Language inadvertently struck from the new listing of temperature criteria in the proposal was reinserted to assure protection of aquatic life. The language states that in addition to the temperature criteria, wastes may not cause more than a 2°F rise in temperature in any 1-hour period.

Subsection (e), which was proposed to be deleted, is reinserted as (b) and the accompanying table is renamed Table 4 in response to comments that pointed out that the Table provides a ready reference to the criteria applicable to aquatic life uses, including High Quality and Exceptional Value Waters. The table has been modified to acknowledge the removal of the list of Statewide criteria (former Table 4) and the numbering change to DO criteria.

Accordingly, numbering changes are made to the remaining subsections. Subsection (c) is amended to the original language that provides that additional criteria will (not may as proposed) be developed using best scientific information. New subsection (d) is clarified to state that when the Department determines that the natural quality of a surface water is lower than the applicable aquatic life water quality criterion, the natural quality will become the aquatic life criterion for that segment following public notice and comment.

Section 93.9. Designated water uses and water quality criteria.

Section 93.9e (relating to Drainage List E) is modified to correct the turbidity criteria symbols from Tur 3 and 4 to Tur 1 and 2. The change is not substantive.

In § 93.9o (relating to Drainage List O), several comments on the proposal and ANFR addressed the issue of the color criterion for the Codorus Creek in York County. Some comments gave lengthy reasons why 50 pcu was the appropriate criterion and should remain in place, and others questioned the scientific basis for that criterion, stating the Statewide criterion should apply. Following consideration of all the comments, the site-specific color criterion for the Main Stem, Codorus Creek in York County is removed and the Statewide color criterion (75 platinum cobalt units) will apply to the stream. When it is achieved, the criterion will enhance water quality in the stream.

In § 93.9p (relating to Drainage List P), an error for Tunungwant Creek in McKean County, which deleted the water contact sport use (WC) for the main stem from the

confluence of the East and West Branches to the PA-NY State border, has been corrected. The Department conducted a use attainability study in 1985 which supported the correction and the water contact sports use was added as a designated use at the November 15, 1988, Board meeting, and published at 17 Pa.B. 968 (March 11, 1989). This regulatory revision was not, however, incorporated into the *Pennsylvania Code* until now.

Chapter 95. Wastewater Treatment Requirements

Section 95.1 (relating to special protections), which has recently been amended at 29 Pa.B. 3720 (July 17, 1999) is deleted as unnecessary in light of the inclusion of the language in § 92.2a(a).

Commentators objected to the incorporation of provisions in § 97.15 into § 95.2 of the final-from regulations. These provisions incorporate quality standards for industrial wastes including the prohibition of discharges that are acid, a pH requirement and an iron limit of no more than 7 milligrams per liter of dissolved iron. These provisions were retained in the final-form regulations as necessary to protect water quality from pollutants not regulated as point sources under the NPDES regulations.

Commentators objected to the elimination of §§ 95.4 and 95.5 from proposed rulemaking. This error occurred at the Legislative Reference Bureau, and was corrected at 28 Pa.B. 577 (November 7, 1998).

[Continued on next Web Page]

webmaster@PaBulletin.com

West Virginia Coal Association
PO Box 3923, Charleston, WV 25339 ■ (304) 342-4153 ■ Fax 342-7651 ■ www.wvcoal.com

October 14, 2005

Triennial Review Comments

Attachment "E"

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

AUG 0 2 2001

Honorable David E. Hess
Pennsylvania Department of Environmental Protection
Rachel Carson State Office Building
P. O. Box 2063
Harrisburg, PA 17105-2063

Dear Secretary Hess:

The Pennsylvania Department of Environmental Protection (PADEP) finalized new and revised water quality standards by publishing the revised regulation in the *Pennsylvania Bulletin* on November 18, 2000. Pennsylvania's Independent Regulatory Review Commission had approved the new regulations on August 24, 2000. The Department of Environmental Protection's Office of Chief Counsel certified on December 13, 2000, that these regulatory changes were adopted pursuant to the Commonwealth's legal procedures, and that the Office of Attorney General and the Governor's Office of General Counsel had also approved the final regulatory changes for form and legality. The revised water quality standards and supporting material were forwarded to the United States Environmental Protection Agency (EPA) for review in accordance with Clean Water Act (CWA) Section 303(c)(2)(A) on December 15, 2000. This package was received by EPA Region III on December 20, 2000.

EPA Region III has completed its review of Pennsylvania's new or revised water quality standards. EPA hereby approves the Pennsylvania WQS submission as consistent with the requirements of the CWA and 40 CFR Part 131. EPA is impressed with the scope of this submission, and would like to commend especially the Department for its revisions to address the way that ambient concentrations and natural background levels are considered with regard to water quality criteria. EPA also appreciates Pennsylvania's change in rounding so that criteria are now rounded to two significant digits. Enclosures 1 (Chapter 93) and 2 (Chapter 16) to this letter list all sections of the new and revised regulations that are being approved in accordance with CWA Section 303(c)(3) and 40 CFR Part 131. Enclosure 3 provides additional detail on several approved provisions.

At this time, EPA is approving Pennsylvania's revision to its bacteria criteria, which are more stringent than its previous bacteria criteria and, therefore, consistent with Section 303(c) of the CWA requirements. However, the Commonwealth should be aware that in 1986, EPA published the *Ambient Water Quality Criteria for Bacteria*, which recommended that *Escherichia coli (E. coli)* and enterococci are the best indicators to determine potential risk from acute gastrointestinal disease. EPA is pursuing a national effort to have states adopt these indicators. In addition, the new Beach Act amendment to the CWA requires states with coastal and Great

Lakes waters to adopt these indicators by 2004. We ask that Pennsylvania enter into a management agreement with EPA Region III to accomplish this goal as soon as possible.

With its triennial review, Pennsylvania submitted the new Chapter 96 (Water Quality Standards Implementation) for our reference and general information, rather than for EPA review. As this chapter was not submitted for our review, we will not be approving or disapproving specific provisions. However, we do have several comments on this chapter that EPA will be providing to the Commonwealth under a separate letter.

As part of EPA's obligation under the Endangered Species Act (ESA), EPA prepared a biological evaluation to determine if our approval of the new and revised sections of the water quality standards will adversely affect threatened and endangered species and their critical habitat in Pennsylvania. Our biological evaluation found that our approval action would not adversely affect threatened or endangered species. We have shared this biological evaluation with the Fish and Wildlife Service and the National Marine Fisheries Service and they concurred with our finding on May 21, 2001 and May 15, 2001, respectively. We are enclosing a copy of the evaluation (Enclosure 4) for your information. The completion of the biological evaluation and concurrence from the Services fulfills our obligation under Section 7 of the ESA on this federal action.

We are looking forward to working with you and your staff on the management agreement regarding Pennsylvania's revisions to its bacteria criteria and on the Commonwealth's next triennial review. If you have any questions, please feel free to contact me or have your staff contact Cynthia Yu-Robinson at (215) 814-5557.

Sincerely,

Rebecca W. Hanmer

Rebecca W. Hanmer, Director
Water Protection Division

Enclosures (4)

cc: Larry Tropea (PADEP)
Terry Fabian (PADEP)
Fred Marrocco (PADEP) ✓
Edward Brezina (PADEP)
Carol Young (PADEP)
David Densmore (US FWS)
Tim Goodger (NMFS)

EPA has decided to approve the Pennsylvania adoption of the aquatic life criterion for mercury as inorganic. The main basis for our decision is that, regardless of the form of the criterion that is specified, at this time all EPA-approved methods for monitoring mercury measure for total mercury. According to a March 16, 2001, letter from the Commonwealth, no translator procedures or other methodology is used to reduce the analytical monitoring results in any way. Therefore, EPA finds that Pennsylvania will be applying its mercury criterion in a protective manner.

We would like to continue discussions with Pennsylvania on this topic, and will pass along information as to the toxic effects of methyl mercury as it becomes available. Should additional methods become available which allow for distinguishing between total and inorganic mercury, EPA would revisit this approval.

Aquatic Life Aluminum

In 1994, EPA disapproved Pennsylvania's aluminum criteria. In order to address that disapproval, Pennsylvania adopted EPA's recommended aquatic life criterion for protection from acute exposures. EPA had requested that the Commonwealth adopt the chronic number as well, or provide a rationale as to why it did not. The Commonwealth did not adopt the chronic criterion, and in response expressed their discomfort with the EPA chronic recommendation, citing the chronic toxicity test results that showed inconsistencies within tests and between studies. Pennsylvania also objected to the lowering of the final chronic value based on the protection of brook trout and striped bass, noting that EPA had previously asserted that these data should not be used in the criterion development.

Aluminum is considered a non-priority pollutant by EPA, and on that basis and the basis that EPA Region III recognizes the uncertainty surrounding the chronic aquatic life criteria, we will not recommend to the Administrator that she use her discretionary authority and promulgate the chronic aluminum aquatic life criterion at this time. However, should additional information become available, or if there are indications that aquatic species in the Commonwealth are being impacted by chronic levels of aluminum, EPA Region III may reconsider this position.

Appendix A: Water Quality Criteria for Toxic Substances

With the exception of a few parameters noted below, this biological evaluation will not address the appropriateness of aquatic life criteria established based on EPA recommendations. All of these parameters will be considered under the national consultation on water quality criteria called for under the recent ESA MOA. As stated in the ESA MOA, separate consultation on criteria that are identical to or more stringent than the existing 304(a) criteria, will not be necessary, subject to requirements related to reinitiation of consultation under 50 CFR 402.16. EPA's approval action on these criteria is subject to revision based on the results of the consultation.

Aluminum

This criterion had been previously disapproved by EPA when it was located in Chapter 93. In order to address the disapproval, Pennsylvania adopted EPA's acute aquatic life recommendation in Chapter 16. Pennsylvania adopted the EPA recommendation for the protection of aquatic life from acute exposures (the appropriateness of the acute criterion will be addressed under the national consultation), but did not adopt EPA's chronic recommendation. The Department believes that the federal aluminum chronic criterion of 87ug/l should not be adopted because it is based on chronic toxicity test results that show inconsistencies within tests and between studies, and it question the supporting data on which the chronic criterion has been based. Pennsylvania indicates that the chronic studies described in the 1988 Ambient Water Quality Criteria for Aluminum do not reveal a consistent pattern of toxicological response to the different exposure concentrations within and/or between the various tests described, and that the final chronic value should be equal to the Criterion Maximum Concentration (CMC) since, based on available acute-chronic ratios, the final FACR should be 0.9958. According to EPA's criteria development guidance, the FACR cannot be less than two so that a final chronic value cannot exceed the CMC. However, EPA lowered the final chronic value to 87 ug/l, saying it was necessary to protect brook trout and striped bass.

The issues surrounding the chronic aluminum criterion are not new, and EPA Region III is not taking issue with Pennsylvania's lack of a criterion at this time. We do not believe that the absence of the chronic criterion will be adversely affect threatened and endangered species in Pennsylvania. Our reasoning is that the two specific species that the chronic criterion was lowered to protect, brook trout and striped bass, are not threatened or endangered. Also, if Pennsylvania finds that other species are being adversely effected by chronic exposures to aluminum, they could use the general criteria to develop a protective criterion.

Mercury

Pennsylvania has adopted EPA recommendations to protect aquatic life from mercury. EPA specifies in its *National Recommended Water Quality Criteria-Correction* (April 1999) that while the mercury criterion was developed based upon data for only inorganic mercury, it should be applied to total mercury. If not, depending upon the amount of organic mercury in the water

RESPONSE TO COMMENTS—47CSR2

The following is a response to the comments provided during the public comment period on the Department of Environmental Protection's rule, 47CSR2-- "Requirements Governing Water Quality Standards." Written comments were accepted until July 17, 2006. A public hearing was held on July 17, 2006. Both verbal and written comments were received and each will be addressed below.

I. COMMENTER: Mr. Ernie Nester

COMMENT A. *The definition of "trout waters" and the B2 trout list.*

The commenter recommends retaining the definition of "trout waters" as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations." The commenter also acknowledges that the additions to the trout list are a definite improvement over the old list and would like to see a B2 list which includes all trout streams in West Virginia. The commenter also contends that it would be good to have a better list of the trout streams for companies who are planning projects on waters, to know what kind of stream they're going to be discharging into.

RESPONSE A. The DEP agrees that the definition of "trout waters" in section 2.19 of the proposed rule should remain as stated and acknowledges the fact there are more streams which could go on the B2 list in the future, as data becomes available. DEP also agrees that a more complete list would aid companies who are planning projects.

II. COMMENTER: Mr. Ed Haynes

COMMENT A. *The definition of "trout waters" and the B2 trout list.*

The commenter recommends retaining the definition of "trout waters" as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations." The commenter also acknowledges that the additions to the trout list are a definite improvement over the old list but state that there are an awful lot of trout streams that are not on the currently proposed B2 list.

RESPONSE A. See Response to Comment I. A above.

COMMENT B. *B2 listed streams on Tier2.5 list.*

The commenter states that there are many streams that are on the B2 list that really should be on the Tier 2.5 list also, based on the DNR data, which shows reproduction in these streams.

RESPONSE B. Listing streams for Tier 2.5 protections and designating streams as Category B2 "Trout Waters" are different processes with different requirements and are covered in separate rules. The "Trout Water" designation in the Water Quality Standards (WQS) rule is

based on whether the water meets the definition of a "trout water" in section 2.19 of the proposed rule. "Trout waters are waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations." While many streams appear on both lists, the Tier 2.5 "presumptive" list is currently undergoing a separate public process which includes requirements not applicable to this process.

III. COMMENTER: Mr. Larry Orr (chairman of the West Virginia Council of Trout Unlimited)

COMMENT A. *The definition of "trout waters" and the B2 trout list.*

The commenter recommends that the current definition of "trout waters" in the proposed rule must be retained as stated to protect West Virginia's streams.

RESPONSE A. See Response to Comment I. A above.

COMMENT B. *B2 trout list is not all inclusive.*

The streams currently in the B2 list are a good start, but the list is not all inclusive. The definition must continue to allow streams not currently on the list, but known by DNR and/or the DEP to sustain year-round trout populations, to be managed as B2 streams.

RESPONSE B. The DEP agrees with this comment and acknowledges that the list is not all-inclusive. The proposed B2 list better represents the extent of the resource present throughout the state.

IV. COMMENTER: Mr. Charlie Nichols

COMMENT A. *The definition of "trout waters" and the B2 trout list.*

The commenter encourages the DEP to keep the language in proposed rule 47CSR2 defining trout waters as "waters which sustain year-round trout populations." The commenter also recommends the addition of Old Field Fork on the B2 trout list, based on data from Trout Unlimited and the Elk River Headwaters Association.

RESPONSE A. See Response to Comment I. A above. Old Field Fork at this time is not on the B2 list based on the current data available to the DEP. As data becomes available in the future, streams can be added to the list.

COMMENT B. *B2 listed streams on Tier2.5 list.*

The commenter encourages the DEP to offer Tier 2.5 protection to the streams on the B2 list.

RESPONSE B. See Response to Comment II. B above.

V. COMMENTER: Mr. Evan Hansen (West Virginia Rivers Coalition)

COMMENT A. *Nutrient Criteria for lakes and reservoirs.*

The WVRC as one of the members of the Nutrient Criteria Committee states that the consensus reached by the committee is represented in the rule language and urges DEP to preserve the nutrient language as well as support efforts to gain its approval through legislature.

RESPONSE A. The DEP agrees that the nutrient language in the rule represents the consensus of the committee and supports its approval.

COMMENT B. *The revised list of trout waters.*

The WVRC commends the listing of an additional 337 streams as "Trout Waters" as defined by Section 2.19 of the proposed rule, 47 CSR 2. The WVRC strongly encourage WVDEP to uphold these proposed designations. The WVRC also encourages the WVDEP continue to recognize the WVDNR as the expert agency with regard to the assessment of trout populations and trout streams across the state.

RESPONSE B. The DEP agrees that the listing of the 337 additional streams is warranted based on the data from WVDNR. The DEP agrees that the WVDNR should be recognized as the expert agency with regard to the assessment of trout populations and trout streams across the state.

COMMENT C. *Existing uses and trout waters.*

The WVRC states that Sections 4.1.a and 6.1.b of 47 CSR 2 require the protection of existing uses. "Existing uses" are "those uses actually attained in a water body on or after November 28, 1975."[1] The proposed B2 list therefore correctly includes waters where sustained year-round trout populations, or trout reproduction, have been documented since November 28, 1975. We commend WVDEP for taking these required actions.

RESPONSE C. The DEP agrees that the addition of streams to the B2 list consistent with the "Existing uses" definition in the rule and 40 CFR §131.3.

COMMENT D. *Tier 2.5 listings and B2 designation.*

The WVRC urges the clarification that the listing of streams for Tier 2.5 protections and designating streams as Category B2 "Trout Waters" are completely different processes, with different protections.

RESPONSE D. See Response to Comment II. B above.

COMMENT E. *Removal of site-specific criteria for several streams.*

---

[1] See also 40 CFR §131.3

The WVRC supports the removal of several site-specific exemptions from rule as listed below.

- *Section 7.2.d.6.1, which exempted Stony River from thermal criteria, which expired in 1998;*
- *Section 7.2.d.20.3, which set site-specific numeric temperature criteria for Simmons Creek, which also expired in 1998; and*
- *Section 7.2.d.14.1, which excluded Water Use Categories A and E certain tributaries of the Youghiogheny River, for which WVDEP was unable to find any documentation.*

RESPONSE E. The DEP agrees that these exemptions needed to be removed from the rule.

COMMENT F. *Changes to many criteria for metals.*

The WVRC supports the updating of the formulas in Appendix E for five metals: cadmium, copper, nickel, silver, and zinc, in an effort to reflect those recommended by EPA in 2002. The WVRC also suggest that the wording and formulas in Sections 8.9.2 and 8.9.3 for dissolved trivalent chromium be edited to be consistent with those used for cadmium, copper, lead, nickel, silver, and zinc.

RESPONSE F. The DEP agrees that the updated formulas reflect those recommended by EPA in 2002. The DEP also acknowledges that the wording in Appendix E, sections 8.9.2 and 8.9.3 for dissolved trivalent chromium should be edited to be consistent with that used for cadmium, copper, lead, nickel, silver, and zinc.

VI. COMMENTER: Ms. Vikki Jo Kennedy-Sims

COMMENT A. *Lowering of Water Quality Standards and the trout list.*

The commenter discourages the lowering of the Water Quality Standards. The commenter also supports the inclusion of the entire B2 list with no streams removed.

RESPONSE A. The DEP agrees that the B2 list should be included in the rule as proposed. The DEP respectfully recognizes the concerns of the commenter in regard to lowering of standards and will take them under advisement during the rulemaking process.

VII. COMMENTER: Mr. Michael Ross

COMMENT A. *B2 trout list.*

The commenter recommends that streams that lack data to support that they are trout streams, should be included on the B2 list until proven otherwise.

RESPONSE A. The DEP believes that the data and expertise provided by the DNR is reliable and serves as credible rationale for the inclusion of streams on the B2 list. The DEP will continue to work with the DNR to accumulate data in an effort to make the B2 "trout waters" list as accurate and as complete as possible.

VIII. COMMENTER: Ms. Liz Garland (West Virginia Rivers Coalition)

COMMENT A. *Removal of the Blackwater River from the B-2 trout water list.*

The current water quality standards classifies the entire length of the Blackwater River as a B-2 trout water. Section 7.2.d.9 applies to the Blackwater River below Davis, and the Blackwater above Davis is listed in Appendix A as a B-2 trout water. WVDEP proposes to delete both of these listings, and to replace them with a listing in Appendix A for the Blackwater River from the mouth of North Fork upstream. If approved, the entire length of the Blackwater River below the confluence with the North Fork would be removed from the B-2 list. In explaining this change, WVDEP's Briefing Document simply states: "In section 7.2.d.9, the Blackwater River is referred to as a trout stream, which is repetitive since it is listed on the trout list in Appendix A. Therefore, section 7.2.d.9 has been amended." This statement is false. The proposed change is not simply the removal of a repetitive reference; it is a delisting of miles of the Blackwater River. The entire Blackwater River should be kept on the B-2 list of trout waters at this time.

RESPONSE A. It was not the intent of the DEP to remove the downstream section of the Blackwater River below the confluence with the North Fork. The Briefing Document reflects DEP's intention, of removing the duplicate listing of the Blackwater River. The DEP appreciates the WVRC pointing out this oversight and will correct the issue by removing the added wording in Appendix A which states "from the mouth of North Fork upstream." This will reinstate the original language that included the entire Blackwater River. The strike-through in section 7.2.d.9 will remain since it is inappropriate to have affirmative statements in this section. It is intended for exceptions.

IX. COMMENTER: Berwind Land Company (BLC)

COMMENT A. *General comment on trout list.*

BLC supports the DEP's effort to assure the protection of the designated uses of state waters, including the protection of streams that have been properly designated as trout waters. Native trout populations should be given every chance to flourish in those streams that have the proper characteristics. In attempting to encourage native trout populations, the DEP must not be overzealous and designate waters for protection that do not support year-round populations, because in so doing, the DEP may wrongly inhibit landowners ability to use their land and deter needed economic development in West Virginia.

RESPONSE A. The DEP agrees that the protection of water uses in the State is important, as well as required under 47CSR2 "Requirements Governing Water Quality Standards" and acknowledges BLC's support. The DEP does not believe that it has been overzealous in listing streams and has performed a very lengthy review of the DNR supplied data. The DEP also notes

it is not only protecting native trout populations with this use category but is also protecting trout that survive year-round.

COMMENT B. *Designating Jacobs Fork as a "trout water."*

The commenter is concerned that the designation of Jacobs Fork as a trout water could have a negative economic impact on BLM's plans to develop the mineral resources along Jacobs Fork based on more stringent effluent limitations and Best Management Practices (BMP's).

RESPONSE B. The DEP acknowledges the concern of the commenter in reference to Water Quality Standards and wishes to point out that economic impact is not a valid reason for not listing a stream if it is determined that the stream meets the definition of the use category. If the planned development occurs, of the approximately 80 individual water quality standards in Appendix E, only ten relate to trout streams: dissolved aluminum, ammonia, dissolved hexavalent chromium, dissolved oxygen, iron, nitrite, silver, temperature, total residual chlorine and turbidity.

COMMENT C. *DEP's data does not support Jacobs Fork's inclusion on the "trout waters" list.*

The DEP has relied on the DNR for information on whether a waterbody has an "existing use" of "trout water" which is defined as any waterbody that currently, or has at any time since November 28, 1975, supported a year-round population of trout. A year round population of trout can be established: 1) when there is natural reproduction of trout observed in the stream; or 2) when a stream survey reveals the presence of multiple year classes of a single trout species. The DEP's "Briefing Document" states that "natural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys." Under this definition it is reasonable to assume that the DEP must have data showing that Jacobs Fork has supported multiple year classes of trout. The data that DEP has offered in support of Jacobs Fork's inclusion simply does not establish that it has ever supported multiple year classes of trout.

RESPONSE C. The DEP agrees with the comment that it relied on the DNR to determine that a water has an "existing use" of "trout water" if it sustained year-round trout populations or trout reproduction has been documented since November 28, 1975, regardless of its current condition. The commenter has not fully represented the definition of a "year-round trout population" in the comment and has misstated the Briefing Document. In addition to the 2 reasons the commenter identifies, the Briefing Document also states "In some cases, a stream is considered capable of sustaining a year-round trout population if only one year-class is collected during sampling prior to that year's scheduled fingerling stocking. A stream may also be considered capable of sustaining a year-round trout population if one year-class is collected during the critical low water, high temperature months of July, August, or September." In the four stream surveys for Jacobs Fork done between 7/26/83 and 08/13/85, rainbow trout between 5 and 15 inches were noted and brown trout between 8 and 12 inches were noted. All surveys were done during the critical low water, high temperature months of July, August, or September, which indicates that the stream clearly supports year-round trout. Also in the survey form dated 8/13/85, at station 2 the biologist wrote "natural reproduction of rainbow trout noted at this station." Based on the

complete definition of "year-round population of trout" the data supplied by the DNR clearly supports Jacobs fork's listing as a "trout water."

COMMENT D. *DNR's stream surveys lack relevant information about Jacobs Fork.*

The commenter indicates that the stream surveys do not indicate whether trout observed were multiple age classes or young-of-the-year. Also the mention of evaluating fingerling stockings only, in one of the 1985 survey forms, is troubling for two reasons. First it indicates that Jacobs Fork was a stocked stream, but the DNR stream survey does not make a note of this on other data sheets. This indicates that information may be absent from the DEP's files on Jacobs Fork. Second, because Jacobs Fork was stocked it makes it impossible for DEP to conclude the presence of trout in successive years means that there is a year-round population and it is not the result of stocking. Furthermore any difference in trout size may not represent year classes but be due to stocking at different times of the year. What is detailed in these surveys is the number and size of trout that were collected and certainly this information shows that trout can and have lived in Jacobs Fork. Without adequate information indicating that the trout were of multiple classes, BLC does not believe that the DEP has established that Jacobs Fork has ever supported a year-round population of trout.

RESPONSE D. See Response to Comment IX. C above. The DEP disagrees with the comment that the stream surveys do not support a year-round population of trout, and based on the complete definition in the Briefing Document, it has been noted that the stream surveys for Jacobs Fork clearly support the definition of a "trout water." Fingerling stocking of trout refers to the stocking of trout between 2 and 6 inches in length. Of the 38 trout that were seen in the stream surveys only eleven were within the length to be categorized as fingerlings. The remaining trout were adults. Within the comments it is stated: "What these surveys do detail is the number of trout that were collected and their size. Certainly, this information shows that trout can and have lived in Jacobs Fork." Because trout are present during the critical low water, high temperature months of July, August, or September, as described above in the complete definition, Jacobs Fork meets the definition of a year-round trout population.

COMMENT E. *Natural reproduction has not been sufficiently documented in Jacobs Fork.*

BLC does not believe that the survey forms show natural reproduction based on the mention of fingerling stocking in the stream. The 1985 survey form, which documents the presence of natural reproduction, could have been the result of fingerling stocking mentioned in the second 1985 survey form, therefore this cannot be used as proof of natural reproduction. Finally the BLC supports the comments filed by the West Virginia Chamber of Commerce, with regard to the lack of clarity that surrounds when an "existing use" has been attained. BLC does not believe that a single observation of trout fingerlings can conclusively establish that Jacobs Fork has supported a year-round population of trout at any time since November 28, 1975.

RESPONSE E. See above comments. Natural reproduction is not needed to prove that a year-round population of trout exists, based on the definition of "trout waters".

COMMENT F. *Jacobs Fork suffers from "heavy domestic" pollution that makes it inappropriate to protect as a "trout water."*

The BLC notes that the DNR "Stream Classification Forms" list Jacobs Fork's pollution rating as "0." According to the DNR's rating system this is severe. Unlike other ratings on the classification form, which are based upon field observations and are necessarily subjective, the pollution rating is based upon the results of the stream survey. Due to this existing pollution, Jacobs Fork hardly seems to be the type of pristine trout stream that needs to be protected with the "trout waters" use.

RESPONSE F. The DEP disagrees with this comment and believes that because Jacobs Fork meets the definition of a year-round trout population, it should be afforded the same protection as any trout water regardless of the level of pollution. As stated in the Briefing Document "The list therefore includes waters where sustained year-round trout populations, or trout reproduction, has been documented since November 28, 1975, regardless of their current condition." Because a stream has been polluted at some point in time is not a valid reason not to protect the water. In fact, the water quality standards require the protection of existing and designated uses, as stated above, "regardless of their current condition." The DEP also wishes to point out that in addition to the pollution rating, the number of species and standing crop listed on the DNR "Stream Classification Form" are also based on stream surveys and are used to determine species and numbers of fish. If the commenter is stating that because the pollution number is based on stream survey data, not field observation data, and is therefore valid, then the same would be true for the number, species and standing crop.

X. COMMENTER: Brook Run Mining Company

COMMENT A. *Brooks Run Mining Company (BRN) objects to the listing of Jacobs Fork in Appendix A of the WQS Trout Waters based on existing stream conditions.*

BRM recently contracted Potesta & Associates, Inc. to conduct a stream investigation and evaluation of Jacobs Fork due to the streams inclusion on the WVDEP proposed Tier 2.5 Anti-degradation list. The survey documented various anthropogenic activities and subsequent disturbances in the watershed. No salmonid species of any type were collected at the three stations sampled and none were expected based on the existing stream conditions.

RESPONSE A. See Response to Comment IX. F above. The lack of trout being present now may be due to pollution and as stated in the referenced section the surveys clearly show that the stream has supported a trout population since 1975 and needs to be listed as such.

COMMENT B. *The DNR data does not support the inclusion of Jacobs Fork.*

The commenter states that BRM has reviewed the data supplied by the DNR, which was utilized by the DEP in determining that Jacobs Fork supports a year-round trout population. BRM believes that this information is insufficient to warrant the stream's listing because the three surveys conducted in the stream between 1983 and 1985 are 20 years old and indicate a warm water fish community. While two non-native salmonids, the rainbow trout and the brown trout were found in the stream, no native brook trout were found during these surveys. Although one survey did find young-of-the-year it was conducted to evaluate a stocking program and clearly documented the presence of stocked fish. Only once were size classes found that represented

anything but stocked fish. The DNR website does not indicate that the stream still receive trout stockings and trout are not found in the stream currently.

RESPONSE B. The DEP disagrees with this comment and believes that the DNR data does support the inclusion of Jacobs Fork on the trout list. See Response to Comments IX. C and IX. D, and IX.E. Also as mentioned above the lack of trout being present now may be due to pollution and as stated in the referenced section, the surveys clearly show that the stream has supported a trout population since 1975 and needs to be listed as such.

XI. COMMENTER: Dominion Resources

COMMENT A. *Difficult Creek was removed from the Tier 2.5 list and should be removed from the WQS trout list.*

The commenter requests the removal of Difficult Creek, a tributary of the North Branch of the Potomac, from the Appendix A trout list due to the absence of suitable trout habitat. The commenter provided information and justification in July 2003, for not listing the upper portion of Difficult Creek, near the North Branch Power Station, on the Tier 2.5 list due to absence of suitable trout habitat. Based on the absence of suitable trout habitat in the upper portion of the stream Dominion believes that Difficult Creek should also not be designated as a trout stream pursuant to the Water Quality Standards Program.

RESPONSE A. Based on a review of the reasons for stream removal from the proposed Tier 2.5 list, the reason for Difficult Creek's removal was based on coal reserve development planned or underway, not absence of suitable habitat. Based on five surveys done by DNR between 1978 and 1996, brook trout were found in every location including multiple life stages in the July 7, 1996 survey. Documentation written by DNR's former Assistant Chief of Coldwater Fisheries, Don Phares, indicates that as the spawning season approaches, brook trout tend to move upstream toward the headwaters. This fact makes it critical that the headwaters be included in the listing of Difficult Creek as a "trout water" in an effort to protect the present population.

XII. COMMENTER: Bowles Rice McDavid Graff & Love LLP Attorneys at Law on behalf of Century Aluminum of West Virginia, Inc.(CAWV)

COMMENT A. *Support of the revised aluminum criteria.*

The commenter supports the proposal to adopt the interim aluminum criteria as final based on the Environmental Protection Agency's statement "the criteria are protective of the aquatic life regardless of whether they apply temporarily or permanently."

RESPONSE A. The DEP agrees that the revision to the aluminum criteria is protective of aquatic life in West Virginia and acknowledges the commenter's support.

XIII. COMMENTER: James Boswell (Peabody Energy)

COMMENT A. *Hopkins Fork should not be included on the Appendix A trout list.*

Hopkins Fork was incorrectly added to the Tier 2.5 list in the anti-degradation rule and was subsequently removed for technical reasons prior to 9/05. The inclusion of Hopkins Fork on the Appendix A trout list will have major implications for our operations.

RESPONSE A. See Response to Comments II. B, in reference to the Tier 2.5 and the B2 trout list. The DNR data supplied in support of Hopkins Fork show both rainbow trout and brown trout were found during the survey done July 25, 1995. The presence of trout in the stream during the critical low water, high temperature months of July, August, or September indicates that Hopkins Fork is not only capable of sustaining a year-round trout population but in fact does. For this reason Hopkins Fork meets the definition of a trout stream and should remain on the Appendix A trout waters list.

XIV. COMMENTER: Independent Oil & Gas Association of West Virginia (IOGA)

COMMENT A. *Aluminum Criteria Changes*

The IOGA strongly supports the DEP's proposal to finalize the interim aluminum criteria due to expire on July 4, 2007 based on EPA's statement that "the criteria are protective of the aquatic life regardless of whether they apply temporarily or permanently."

RESPONSE A. The DEP agrees that the revision to the aluminum criteria is protective of aquatic life in West Virginia and acknowledges the commenters support.

COMMENT B. *Adding of such a large number of streams to the "Trout Waters" list at one time does not assure that each listing is supported by adequate and accurate data.*

The IOGA believes that the DEP should consider an alternate approach to adding such a large number of streams to the "trout waters" list at one time. It is undeniable that adding over 300 streams at one time is an unwieldy process that has the potential to deny each stream the close scrutiny and examination that it deserves. IOGA is concerned that if a stream is erroneously included on the "trout waters" list based upon insufficient data, it will be very difficult to correct the mistake at a later date. By taking into consideration fewer streams at one time, the DEP will be able to better justify its decision on whether to add or remove a stream from the list and avoid errors. IOGA suggests a phased approach, which would add streams at reasonable pace. By doing so it would allow the DEP and DNR the opportunity to correct deficiencies in the underlying data that have been addressed by commenters in the Tier 2.5 Antidegradation Implementation rule-making process. The IOGA suggests the phased approach previously submitted in June, 2004 be used to review 30-50 streams a year and provide the surrounding community the opportunity to become better educated.

RESPONSE B. The DEP disagrees with the comment that an alternate approach should be used in adding trout waters to the B2 list. The addition of streams to the B2 list is based on the stream's meeting the definition of "trout waters" in 47CSR2. The data supporting the determination that a stream meets this definition has been reviewed by the DNR and the DEP. Both agencies contend that the streams listed as "trout waters" are capable of sustaining a year-round population of trout as defined in the proposed rule. To employ an alternate approach

would cause the delayed inclusion and protection of these streams. The list of trout waters in Appendix A of 47CSR2 has not been updated for over 20 years and is greatly underrepresentative of the number of actual trout streams in West Virginia. The DNR has been doing stream surveys and evaluating trout streams during this 20-year period. The triennial review process outlined in the federal Clean Water Act was established to ensure that such review of available data and updating of the rule occurs. Also, the DEP is in fact taking the position that many more streams (than ones listed in the current rule) are trout waters, and it is better from a public policy standpoint to have an accurate listing in the rule for all to see.
The suggestion that there are "deficiencies in the underlying data that have been addressed by commenters in the Tier 2.5 Antidegradation Implementation" is misleading and has been addressed in the response to comments for that rule. As mentioned earlier in the document, the process for inclusion in the Tier 2.5 list is different than the process for the "trout waters" list. The DEP believes the public participation it has conducted has been more than adequate to solicit input on this important issue. See Response to Comments XVI. I.

COMMENT C. *Listing a stream is not necessary to protect the "trout waters" use.*

The DEP's proposal to include 337 streams on the "trout waters" list is unnecessary based upon the language of the water quality standards and the agencey's own statements in its Briefing Document detailing the changes to 47 CSR 2. Under Sec 6.3.b of the water quality standards rule, caption "Category B2- Trout Waters," it states that this category includes all streams that meet the definition of "trout waters" contained in Sec. 2.20. The Briefing Document states that the Appendix A list is meant to be representative of the "trout waters" in the state, but is not meant to be an exhaustive list of all streams that fit the definition of "trout waters." As such it is not necessary to add all 337 streams at one time because streams can be protected as "trout water" even if they are not included on Appendix A.

RESPONSE C. The DEP agrees that the list is not an exhaustive one and that the agency may make a case-by-case determination when a stream is not on the list. The reason for this approach is that there may very well be additional streams that qualify as "trout waters" for which documentation does not presently exist. However, it does not follow that because other streams may be considered "trout waters" (independent of the rulemaking process, or added to the rule in the future) that there is not value in having as accurate and current a list as possible contained in the State water quality standards rule. A list of all the known trout streams should be available to all citizens of the State so that a person can know from the outset whether a particular stream is considered a trout stream and therefore protected by several more protective criteria. Certainly any person or company considering discharging wastewater into a stream in the future would benefit by knowing whether a stream is a trout stream Also, by finalizing the determination in the rulemaking process as opposed to a case-by-case basis, everyone has the opportunity to participate in this most important decision.

Furthermore, the list of approximately 165 streams in the current rule has not been updated since 1985 and is clearly underrepresentative of the number of actual trout streams. Although the agency tries to rectify this situation by developing and using an alternative listing in the permitting and other processes, an accurate list should be made a part of the state water quality standards rule. Also the triennial review process outlined in the federal Clean Water Act was

established to ensure that the review of available data and updating of the rule occurs. This Appendix has been unchanged for over 20 years and clearly requires updating.

XV. COMMENTER: Mr. Sammy Gray (West Virginia American Water)

COMMENT A. *Appendix B. update*

WVAW recommends the updating/revision of the list of public water supplies in Appendix B. WVAW also provided 23 public water supplies on the list that they believe need addition, deletion, or operating company revisions on the list.

RESPONSE A. The DEP acknowledges that the public water supplies listing (Appendix B) in the rule is needs to be reviewed and possibly updated. The DEP plans on undertaking this review during the next review of the rule.

XVI. COMMENTER: West Virginia Chamber of Commerce

COMMENT A. *Support of the revised aluminum criteria.*

The Chamber supports the DEP's proposal to finalize the interim aluminum criteria based on EPA's findings that "the criteria are protective of the aquatic life regardless of whether they apply temporarily or permanently."

RESPONSE A. The DEP agrees that the revision to the aluminum criteria is protective of aquatic life in West Virginia and acknowledges the commenters support.

COMMENT B. *Addition of 337 streams to Appendix A*

Appendix A of the proposed 47 CSR 2 contains the list of known "trout waters" within West Virginia. "Trout waters" are defined as "waters which sustain year-round trout populations. Excluded are those waters which receive annual stockings of trout but which do not support year-round trout populations." A year-round population of trout can be established when there is natural reproduction of trout observed in the stream or when a stream when multiple age classes of a trout species are observed in a stream at on time. The DEP's "Briefing Document" states that "natural reproduction is verified when multiple year classes, including young-of-the-year, are collected during population surveys." The data that DEP has offered in support of the inclusion of many streams does not establish that they support year-round populations based on the definition of year-round population.

RESPONSE B. The commenter has not fully represented the definition of a "year-round trout population" in the comment. In addition to the two reasons the commenter identifies, the Briefing Document also states, "In some cases, a stream is considered capable of sustaining a year-round trout population if only one year-class is collected during sampling, prior to that year's scheduled fingerling stocking. A stream may also be considered capable of sustaining a year-round trout population if one year-class is collected during the critical low water, high temperature months of July, August, or September." Based on the complete definition in the Briefing Document, the DNR data shows the presence of trout during the low water, high

temperature months of the year. This summer period is considered the high stress period for trout. The water temperature is at its highest and typically the Dissolved Oxygen would be at its lowest, due to the temperature. If trout are surviving during this period of the year it is generally accepted that they will survive year-round.

COMMENT C. *The stream surveys relied upon by DEP do not provide sufficient information to support the inclusion of many streams.*

Both Conley Run(MT-77) and Poplar Creek(KE-76-0) provide a typical example of the type of information included in the stream survey data sheets that DEP is using to justify their addition to the "trout water" list. Conley Run survey was done July 28, 1987 and showed the presence of three brook trout that were seven to nine inches in size. The Poplar Creek survey was done July 24, 1985 and showed the presence of four brook trout. No mention was made in either survey of natural reproduction or young of-the-year. In the absence of this information, the DEP has no basis for adding these streams to the list according to its own Briefing Document.

RESPONSE C. Based on the response to Comment XVI.A above, when the complete definition of "year-round population" is used it is clear that both Conley Run and Poplar Creek show the presence of trout surviving during the critical low water, high temperature months. The DNR surveys clearly support the conclusion that these streams contain a year-round population and the listing of these streams as "trout water" is appropriate. The surveys do not need to show natural reproduction or young of the year to prove survival of a year-round population of trout.

COMMENT D. *In many instances the DNR data were not adequate to characterize the streams as trout waters*

A question raised by the DEP's reliance on the DNR's stream surveys is whether these surveys accurately reflect either the past or current condition of the stream. This is partly because many stream were not surveyed on a regular basis. Many of the surveys reflect a snapshot in time and a more comprehensive assessment would be more accurate. In fact, the West Virginia stream Classification Form for Poplar Creek notes that the presence of brook trout in the stream was "probably a result of stocking by locals." If these streams are being stocked, it calls into question the DEP's inclusion of a stream on the presence of fingerlings only. This type of information does not justify a conclusion that Poplar Creek, or any other stream, supports a trout population on a year round basis.

RESPONSE D. The DEP disagrees with this comment. Regardless of the party that is stocking the stream, if the trout are surviving year-round as described in Response to Comments XVI.B and C, they will survive the remainder of the year. Although some streams have only been surveyed one time, the survey typically characterizes the stream accurately. The stream biologist coordinating a survey, go to great lengths to survey a stream section or sections that are representative of the entire stream length in question. The accuracy of this data to DNR is very important so as not to waste resources managing a stream for a population that is not accurately represented. The survey results are also coupled with the expert opinion of the lead biologist on the survey and his knowledge of the area to make a determination as to whether a stream supports trout reproduction or a year-round population.

COMMENT E. *The "existing use" concept.*

The DEP takes the position that even though a stream does not currently meet the definition of "trout waters," it may still be considered as such if it did at any time on or after November 28, 1975 because of the "existing use" concept. This interpretation is backward. If the DEP cannot first show that the stream meets the "trout water" definition at the current time, it should not look back to information that shows the stream met the definition at some point after 1975.

RESPONSE E. DEP disagrees with the commenter's position. Water quality standards are required to protect existing and designated uses, and "existing uses" are defined as those attained on or after November 28, 1975. It is therefore most appropriate for the DEP and DNR to evaluate the data and documentation against this standard, not only considering whether a stream currently meets the definition of "trout waters," but also whether it has met the definition on or after the date in 1975. Contrary to the commenter's suggestion, the DEP is not using the principle of "existing use" to obviate the need for adequate documentation. It simply means that any stream not currently meeting the definition but for which documentation shows that the definition was met on or after 1975, must be treated as a "trout water" and included on the list.

COMMENT F. *Additions to "trout water" list based on limited data.*

The DEP's justification of its decision to add streams to the "trout water" list based upon limited data is contrary to DEP's approach in other water quality programs. In particular, the agency's guidance for the antidegradation program requires a minimum of twelve samples be taken over a six month period to establish a baseline water quality and in the TMDL program, the agency suggests that twenty samples is an appropriate data set for saying that a stream is impaired. Just as with these two examples, the DEP should not use anything less than a comprehensive survey of fish species, made at different times of the year and multiple water quality sampling events.

RESPONSE F. The commenter claims the level of data for this determination should be equal to the data necessary for background water quality on permit applications. The DEP disagrees. The additional data necessary to establish background water quality [either TMDL or Anti-deg BWO] is necessary to calculate specific discharge limits. While data may be sufficient to demonstrate "trout water" status, it may be insufficient to cover all the peak and low flow periods necessary to ensure that effluent discharges do not violate water quality standards.

COMMENT G. *Determining an existing use.*

The DEP is essentially applying a standard that any use, if observed on at least one occasion, means that the use has been actually attained. Neither the State nor the USEPA has attempted to define a standard of proof for establishing when an existing use is actually attained. This could cause confusion and unintended consequences. The EPA has provided recent guidance on ways to improve the effectiveness of doing use attainability analyses (UAAs), stating that UAAs are meant to assess what is attainable, not simply to document the current water quality condition and use (although documenting current conditions is often part of the analysis). The DEP should establish guidelines for determining when an existing use is actually attained and should

use both an adequate number of data points and sound methodology in the way that samples are collected. This would remove the subjectivity that seems to pervade existing use determinations reflected in this proposal.

RESPONSE G. The commenter is suggesting that the manner in which DEP assesses this issue will necessarily have ramifications for all other instances when the DEP decides whether an existing use is currently being attained. This is not necessarily true. For the reasons explained elsewhere in this document, there is sound scientific reason that supports the agency's reliance upon what is sometimes only one survey to determine that a particular stream meets the definition of a "trout water." The agency recognizes that depending upon the context, this may not always be appropriate. For example, in determining whether the drinking water supply use currently exists or not, it may not be sufficient to rely upon one private citizen's statement that he or she has on one occasion drunk water out of a stream when hiking along that stream. The point is that it depends upon the particular existing use that is under discussion as to the nature and quantity of data that is needed to support the conclusion that the use is being attained.

The commenter's citation to the recent EPA guidance on UAAs is misplaced. The emphasis in EPA's recent guidance is on designated uses, not existing ones. The subject under discussion in this guidance is how to establish designated uses that are in fact attainable. A designated use may or may not be one that is currently being attained, that is an existing use, so the commenter's reference to this guidance is not particularly helpful.

Again to reiterate, the approach used by the DEP to decide whether a stream meets the definition of "trout water," represents a sound and objective manner of determining this issue.

COMMENT H. *Listing a stream is not necessary to protect the "trout waters" use.*

Adding these 337 streams to the "trout waters" list at one time is unnecessary because "trout water" can be and are protected through other means. Section 6.3.b states that the list is a representative list, not a comprehensive list and he DEP treats waters meeting the definition as "trout waters" whether on the list or not.

RESPONSE H. See Response to Comments XIV. C.

COMMENT I. *DEP should solicit additional input.*

DEP should solicit input from the public, in the communities surrounding the streams proposed for inclusion on Appendix A for two reasons. First, there is a paucity of information for many of the streams and second, the listing will have a more direct effect on persons living in the area.

RESPONSE I. The DEP believes the public participation it has conducted has been more than adequate to solicit input on this important issue. Beginning in September of 2005, the agency held informational meetings for the public on the planned triennial review and specifically mentioned that the trout stream list would be updated by using DNR documentation. The public notice period just completed consisted of a 45-day notice and comment period, longer than the typical 30-day period usually afforded by the DEP.

Additionally, further public comment is not necessary because the issue at hand is quite simple, whether a stream sustains a year-round trout population. This is in contrast to the recent antidegradation issue that consisted of complex deliberations requiring the agency to strike a delicate balance among several factors-- all of great interest to the general public and regulated community. In that case, the legislative rule (60CSR5) specifically required the agency to solicit input at the local level.

XVII. COMMENTER: WEST VIRGINIA MANUFACTURERS ASSOCIATION (WVMA)

COMMENT A. *Definition of " cool water lakes".*

We applaud the members of the Nutrient Criteria Committee that reached consensus on proposed nutrient criteria for lakes. However, we would urge the DEP to clarify which of the two sets of nutrient criteria found in §8.3.b apply to state lakes. The rule should specify that the criteria apply in the hyperlimnion, and compliance samples should be taken in the non-flowing lacustrine zone of the lake. These were the conditions and locations on which the nutrient criteria were predicated, and they should be acknowledged in the rule.

RESPONSE A. The DEP acknowledges the members of the Nutrient Criteria Committee. The cool water lake criteria apply to the lakes listed in Appendix F, which are the lakes currently being managed by DNR as cool water fisheries. Warm water criteria applies to all other lakes in the state with a residence time greater than 14 days. The proposed language in the rule is based on the consensus statement published by the members of the Nutrient Criteria Committee. Although this language did not address the details referenced in the comment, the DEP will address these points in future guidance.

COMMENTS B. *The WVMA is unaware of any technical demonstrations supporting the assertion that the water quality of each stream can sustain a "year-round trout population."*

RESPONSE B. While the agency could consider the water quality of a stream as one determinant of whether a stream can sustain trout year-round, the DNR's method is actually more conservative, relying primarily upon a stream survey that consists of counting the fish species that are present in the stream. The DEP may decide at some point in the future to consider water quality along with other factors, and whether these should be used to designate trout waters for future use protection. However, at a minimum, the DEP must protect streams that, on or after 1975, sustain a year-round trout population.

COMMENT C. *The DEP was given the trout waters list by the DNR without any independent analysis.*

RESPONSE C. The DEP looked to the DNR for assistance as the State agency with recognized expertise in this area. However, before asking the DNR to examine the factual issues, the DEP worked very carefully with that agency to ensure it understood the exact definition of "trout waters" from the current legislative rule. (The DEP had first decided to continue using the same definition of trout waters that has existed in State law since 1980. The DNR was not unfamiliar

with the definition.) DEP is confident that in working with DNR, the most accurate assessment of this issue will be made.

COMMENT D. *Insufficient data to list a stream as a "trout water."*

The DNR's survey sheets, apparently were not relied upon by the DEP in evaluating the DNR's list. These surveys provide limited data that should not serve as the basis for making such an important decision as a use determination. Some of the streams are listed as trout waters based on observations of trout in a stream (sometimes 20 to 30 years ago), often on just a single occasion. Some surveys do not report young-of-the-year, or any other basis for considering the stream a "trout water". Such data cannot support a finding that trout were present then, or are present now, on a year-round basis. There is a serious disconnect between DNR's listing approach and the definitions specified in the standards.

RESPONSE D. The DEP disagrees with this statement by the commenter. See Response to Comments XV. B, C and D.

COMMENT E. *A systematic evaluation of stream reclassification is needed.*

A systematic evaluation of stream reclassification is needed to determine whether a water body is a legitimate trout stream. We recommend that, prior to listing a water in Appendix A, the DEP require a demonstration that the water will "sustain year-round trout populations" in accordance with the §2.19 definition of trout waters. Such a showing should include, at a minimum, multiple reports of seasonal water quantity and quality, as well as biological data that demonstrate that the instream water quality can sustain a "year-round trout population". This approach is consistent with the antidegradation implementation procedures, 60 C.S.R. 5, for nominating and designating Waters of Special Concern and Outstanding National Resource Waters, which require objective classifications based on sound science.

RESPONSE E. The DEP disagrees with this comment and believes the stream surveys demonstrate that the waters listed meet the definition of "trout waters". In reference to Tier 2.5 listing requirements, see Response to Comments II. B.

COMMENT F. *The DEP should develop alternative trout water classifications.*

We urge DEP to recognize that not all trout waters are of the same quality, and some may not deserve the same level of protection as others. In order to reflect this reality the DEP should change the definition of 'trout waters and/or develop appropriate scientifically-based implementation procedures to recognize the following three trout water classifications: (1) waters that sustain stocked trout for a portion of the year, (2) waters that sustain stocked trout year-round and (3) the more ecologically and socially important "native" or "naturally reproducing" trout waters. The three classification should be given different criteria sufficient to protected the use. Both Pennsylvania and Virginia differentiate seasonally stocked trout waters from the higher classifications of Cold Water Fishes (Pennsylvania) and Wild Natural Trout Streams (Virginia) and apply the appropriate numeric criteria specific to protecting that use. For example, Pennsylvania has a use designation, TSF, which is specific to waters

suitable for maintenance of stocked trout for the period from February 15 to July 31. Water quality criteria protective for the TSF use, in the case of temperature, are clearly different from criteria for the protection of year-round trout fisheries under the Cold Water Fishes (CWF) designated use. Virginia's classification system differentiates between waters suitable for maintenance of wild trout populations (Wild Natural Trout Water) and for the year-round hold-over of stocked trout (Stockable Trout Waters). The Virginia and Pennsylvania approaches enjoy large scale support.
We believe that adopting the DEP's proposed list of trout waters will result in the incorrect designation of many streams, which could yield serious socioeconomic impacts. In light of the above, we recommend that the DEP withdraw its current proposal to modify the Appendix A list. We also recommend that West Virginia develop a more comprehensive process for determining whether the characteristics of water are adequate to support the B-2 trout waters use and that this process be used in developing subsequent listing proposals.

RESPONSE F. The DEP recognizes that States have some flexibility in the manner in which they protect their existing and designated uses, including various kinds of trout waters. In this State, 47CSR2 has included a "trout water" use category with several more stringent criteria since 1970. The particular definition of "trout waters" has remained the same since 1980, essentially including waters that sustain a year-round population of trout. The Environmental Quality Board, and now the DEP, consider the definition to include both naturally reproducing and trout having the ability to "carry over" from year-to-year. The standards in 47CSR2 provide the same degree of protection to all trout that fall within this definition. This means that in West Virginia, there are essentially two levels of protection for trout waters, the criteria that apply to Category B2, naturally reproducing and carry-over trout, and the criteria that apply to "put and take" trout streams, which are the same as the criteria for Category B1 warmwater streams.

The commenter mentions both Pennsylvania's and Virginia's methods of delineating trout waters as being well-supported. Pennsylvania offers the same level of protection for both "maintenance or propagation, or both, of fish species including the family Salmonidae." In this definition, year-round populations are protected with the same level of protection as natural reproduction, just as in West Virginia. Pennsylvania additionally offers seasonal protection for streams that are stocked in the cool weather months as "put and take" fisheries. Currently West Virginia does not offer "put and take" fisheries seasonal protection. Virginia affords "stockable trout waters" (meaning year-round or carry over) and "natural trout waters"(naturally reproducing) separate levels of protection. The dissolved oxygen (DO) and temperature limits for the stockable trout waters are a daily average of 6.0 mg/l DO and a temperature limit of 69.8 °F. West Virginia's limits are in no case less than 6.0mg/l DO and a summer temperature limit of 70 °F—similar to Virginia. The limits Virginia provides natural trout streams are even more stringent and afford more protection. Based on a brief review of Pennsylvania and Virginia's rules, it appears West Virginia's protection may not be as high for naturally reproducing trout streams or "put and take" trout streams.

In conclusion, Pennsylvania's and Virginia's approaches are generally more stringent than West Virginia's. However, the DEP believes it is striking an appropriate balance in protecting its trout waters, and until it finds compelling scientific reasons to change its approach, the DEP believes the current definition should remain as is. The DEP also points out that several other commenters supported the State retaining its current definition of "trout waters."

COMMENT G. *Aluminum Criterion*

We support the DEP's proposed modification of the chronic criterion for aluminum from 87 ug/l to 750 ug/l for all waters except trout waters. As the EPA has acknowledged, this change is consistent with the Clean Water Act and water quality standards program requirements in 40 C.F.R. Part 131. The EPA has already approved the modification on a temporary basis, but made it clear in Jon Capacasa's January 9, 2006 to Director McClung that "EPA's approval of the criteria as modified is based on a finding that the criteria are protective of the aquatic life use regardless of whether they apply temporarily or permanently." The DEP's action in adopting the EPA's conclusions and proposing to make the criterion change permanent is scientifically supportable and reasonable.

RESPONSE G. See Response to Comments XII. A.

COMMENT H. *Use Classifications.*
The WVMA believes the DEP should use this triennial review of standard to clarify its policy for determining which water uses apply in State waters.

RESPONSE H. The DEP is well aware of the issue raised by the commenter in this regard. When the agency first assumed responsibility of the water quality standards effective July 1, 2005, it looked at the existing rule and began identifying areas that might need revision or fine-tuning. In the fall of 2005 the DEP solicited public input on what issues were important to the public, and the refinement of water uses, in particular the Category A drinking water supply use, was important to several entities. However, there were other issues that were more pressing for rule revision in the 2007 rulemaking cycle, and the agency informed the public in the spring of 2006 that it would not be able to consider changes to the Category A use until the next session of rulemaking in 2008. The proposed rule that was filed for public comment on June 2, 2006, did not, therefore, contain any proposed revisions affecting the Category A issue. It would be inappropriate for the agency to make any changes to the rule related to this issue at this point in time. As the agency has informed the general public, the DEP intends to thoroughly study this issue in the next year and will then propose any corresponding revisions to the rule in the spring of 2007 for consideration by the 2008 Legislature.

COMMENT I. *The DEP did not adequately consider economic impacts.*

RESPONSE I. The commenter has cited two particular statutory provisions it believes require the DEP to consider the economic impact of the proposed revisions to the rule. The first is the requirement that all rules include a fiscal note "and a statement of the economic impact of the rule on the state *or* its residents." (Emphasis added). Notwithstanding whatever interpretation is given the cited language, the DEP does not have the ultimate authority to decide what information must be included in a fiscal note for rules. Rather, the Secretary of State's office and the Legislative Rulemaking Review Committee are responsible for designing the fiscal note form and specifying its contents. The Secretary of State and the legislative committee are using the same form as is used by the Legislature for the passage of legislation. The DEP has used the appropriate form and it does not include any requirement for assessing economic impact upon the

regulated public or citizens of the State. It only requires the agency to provide an assessment of potential impacts upon State government.

With regard to the other statutory citation, W.Va. Code §22-11-2, the commenter has provided only a portion of the statutory language. The first paragraph of section 2 states: ". . .{T}he DEP is 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, 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."

This "Statement of Policy" applies to the entire Water Pollution Control Act and requires the agency to generally consider all of the cited factors. To argue, however, that every particular water program must entail an economic impact analysis would not be sound. A comprehensive review of the water quality program shows that in certain rules and programs, economic issues are more important than in other programs and rules. For example, the antidegradation implementation rule, 60CSR5, contains several specific references to economic impacts and requires the agency to consider these impacts when deciding which streams to include on the Tier 2.5 or Tier 3 lists. The water quality standards rule, however, does not address economic issues except when a discharger seeks a redesignation of a use or a variance to the applicable standard. The standard-setting process itself is a straightforward determination of the designated and existing uses of a stream and the water quality criteria necessary to protect those uses. Economics is not a direct consideration.

Although not required to consider such impacts, the agency does not anticipate the proposed trout water changes to have a significant impact upon the regulated public. Although it is adding 337 streams to the trout water list in Appendix A, the agency has in fact been treating these same streams (and others) as trout waters for many years, based upon consultation with DNR.

XVIII. COMMENTER: U.S.EPA Region III (Cheryl Atkinson)

COMMENT A. *Section 2.2. Definitions.*

This section defines "cool water lakes" as lakes managed by the West Virginia Division of Natural Resources (WVDNR) for cool water fisheries, with summer residence times greater then 14 days. EPA supports West Virginia adopting a definition for cool water lakes; however, the definition provided simply references the lakes managed by WVDNR, without actually defining a cool water lake. What is WVDNR's definition of cool water lakes? EPA recommends that West Virginia more precisely define cool water lakes, with reference to the aquatic life communities that are supported in those waters or the physical conditions that define those lakes. In addition EPA recommends that West Virginia add a warm water lake definition for clarity.

RESPONSE A. The cool water lake criteria apply to the lakes listed in Appendix F, which are the lakes currently being managed by DNR as cool water fisheries. Warm water criteria apply to all other lakes in the state with a residence time greater than 14 days. The wording by the DEP, is based on the consensus statement published by the members of the Nutrient Criteria Committee. DEP believes that it is clear which lakes the criteria apply to in the rule.

COMMENT B. *14-day residence time*

Concerning the14-day residence time, please explain how West Virginia calculates and applies the 14-day residence time. The information should discuss whether the residence time is adjusted to account for seasonal variation in tributary discharge, and whether a residence time has been calculated with respect to differences in residence time of the epilimnion and hypolimnion during summer stratification (when it develops). This information will assist in providing support for the lake water classification and on how the proposed criteria protect those classifications.

RESPONSE B. The Nutrient Criteria Committee reviewed a study performed by the Freshwater Institute in relation to impoundment size, inflow rates, and catchment areas resulting in a list of about 30 lakes which supported a 14-day residence time definition. The "14-day" criterion is also justified since "Pennsylvania, with justification through EPA working papers chose the 14-day as a cutoff" (Strawman prepared by Martin Christ 12/8/03). A literature review was then performed February 24, 2004 and a subsequent residence summary time prepared in March 12, 2004 determining that the 14 day time cutoff was appropriate. Residence times are calculated as the average lake volume divided by the average lake outflow in summer months and the following months likely to occur before fall turnover i.e. essentially June thru October

COMMENT C. *Please provide rationale.*

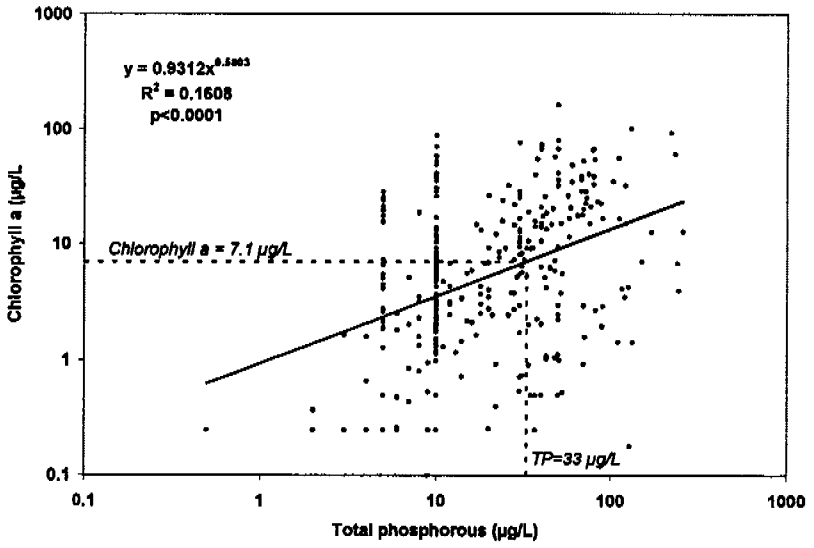
Please provide rationale showing how total phosphorus criteria of 50 ug/l for warm water lakes and 30 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria. Please provide rationale showing how chlorophyll-a criteria of 30 ug/l for warm water lakes and 15 ug/l for cool water lakes protect the designated uses. The supporting rationale should include adequate justifications for both the warm water and the cool water criteria. The rationale should include an analysis to show that the criteria are protective against "worst case" conditions (i.e., hot summers with low flow).

RESPONSE C. Data searches were conducted by the NCC, as well as a statistical evaluation of existing information to support the proposed criteria. The DEP will provide a more detailed justification in its rationale accompanying the final rule.

COMMENT D. *West Virginia should show how the total phosphorous and chlorophyll-a proposed criteria relate to the Trophic State Index scale of eutrophication. Please also show how the expected levels of chlorophyll-a correlate, if at all, to the expected levels of total phosphorus, and how this correlation is reflected in the criteria.*

RESPONSE D. The chlorophyll-a criterion is based on the current DEP practice of listing lakes as impaired with Topographic State Index (TSI) scores greater than 65. This TSI of 65 corresponds to a chlorophyll-a concentration of 33.3 ug/L. (see figure below) TSI relationships will be fully discussed in the rationale document submitted to EPA with the final rule.

Figure 1: Relationship between chlorophyll a and TP in the USACE and CLP datasets



COMMENT E. *Additional Nutrient Criteria for other uses.*

The proposed regulations state that the criteria protect water use categories B and C. Will these criteria also protect other uses from the impact of nutrients? If not, how does West Virginia intend to adequately protect the other uses from nutrients? Does West Virginia plan to adopt additional criteria in the future?

RESPONSE E. The DEP's proposed rule will not protect other uses from the impact of nutrients at this time. Discussions commenced in the summer of 2004 regarding criteria for "A" use protection but the focus was on the development of category "B" and "C" criteria for lakes. In the coming year the DEP will make a closer examination of this issue in addition to looking at criteria for river and streams.

COMMENT F. *Do all of the lakes in Appendix F have a residence time greater than 14 days? If not, or if for some reason the residence time decreases, do the criteria still apply?*

RESPONSE F. The lakes represented in Appendix F have a residence time greater than 14 days. It is possible that retention time could change over time due to sedimentation buildup and DEP would then need to consider removing the lake from the list. By the time this would occur, presumably the criteria for rivers and streams would be in place and then would be applicable.

COMMENT G. *In addition to providing a list of all cool water lakes, West Virginia should provide a list of all warm water lakes, to more clearly specify the particular waters subject to criteria.*

RESPONSE G. The DEP acknowledges the comment but believes that the definition in the rule clearly delineates the difference between warm water and cool water lakes and no further description is required.

COMMENT H. *Downstream water*

EPA's regulations at CFR Part 131.10(b) require that in "designating uses of a waterbody and the appropriate criteria for those uses, the State shall take into consideration the water quality standards of downstream waters and shall ensure that its water quality standards provide for the attainment and maintenance of the water quality standards of downstream waters." How do the proposed criteria account for downstream effects?

RESPONSE H. The issue of protecting downstream uses will better be addressed when river and stream criteria is pursued in the coming year. Currently downstream waters, presumably rivers or streams, lack nutrient criteria if they are within the state borders. DEP recognizes this issue and will work to address it.

COMMENT I. *Please explain how the proposed nutrient criteria will be protective against the degradation of more pristine lakes with much lower level of nutrients.*

RESPONSE I. The State's antidegradation policy contained in 47CSR2 and 60CSR5 applies to all State waters and would thus address this issue.

COMMENT J. *Please explain why a determination of whether a water segment meets the criteria should depend on an average of at least four samples, instead of simply on one sample, or the average of the samples actually taken. How is the sampling procedure establish in the rule protective of the designated uses?*

RESPONSE J. Nutrients levels can be highly variable, especially in smaller waterbodies. The consideration of an average value over the growing season allows for occasional higher values that may be associated with rainfall events. The median value was also considered, but the NCC and DEP feel that the average value is more appropriate than the median because it is affected more by occasional higher values, which can have an ecological impact.

COMMENT K. *Does West Virginia expect to sample all lakes more than four times within the index period? If not, what would trigger additional sampling to determine compliance with the WQS?*

RESPONSE K. DEP's Watershed Assessment Section has started a lakes monitoring program that includes the analysis of at least four nutrient samples during the growing season from each lake according to the established 5-year rotating basin approach.

COMMENT L. *Please explain how the criteria will be assessed to determine impairment for the purpose of the Section 303(d) list.*

RESPONSE L. If the average of the four samples is above the appropriate criteria, the waterbody will be listed as impaired for those uses that the criteria apply (Aquatic Life and Contact Recreation). However, if it is clear that the data was collected under anomalous conditions (e.g. - each of the sampling events were preceded by heavy rainfall) WVDEP may determine that there is insufficient data to determine impairment.

COMMENT M. *EPA supports the language in the proposed regulations which explicitly provides that impairment for nutrients also can be determined based on the application of narrative criteria. EPA recommends that West Virginia further define impairment from nutrient by specifying that in the case of nutrients, a water would be deemed impaired if the nutrients have directly or indirectly caused: nuisance algae or excessive growth of macrophytes; unacceptable water clarity, odor or microbial growth; or an increase or decrease in the relative abundance of species or in the diversity of indigenous communities beyond the normal range.*

RESPONSE M. The DEP believes that the commenter's suggested additions are adequately covered by section 3.2 of the current rule. The DEP will continue to review this issue to assure further refinement, if necessary.

COMMENT N. *Additional nutrient criteria.*

EPA's recommended parameters for nutrient assessment are total phosphorus, total nitrogen, chlorophyll-a, and some measure of water clarity." Please explain and support West Virginia's rationale for not proposing total nitrogen and secchi nutrient criteria for lakes.

RESPONSE N. Secchi depth criteria is not appropriate for WV lakes because clarity is affected more often by sediment than by nutrients. West Virginia water quality rules regulate concentrations of nitrite and ammonia permissible in surface waters. These rules apply to lakes. At the time the NCC was evaluating criteria there was no evidence found that West Virginia lakes are limited by nutrients other than phosphorus.

COMMENT O. *Weirton Socioeconomic Variance*

This section extends the socioeconomic variance until July 1, 2008. EPA reminds West Virginia that documentation in support of the extension of this variance should show that the conditions for granting a variance still apply and that the variance provisions are consistent with 40 CFR 131.10(g). Discharger-specific variances based on the substantial and widespread economic and social economic impact factors should include a demonstration that alternative control strategies were evaluated as part of the showing that standards were not attainable.

RESPONSE O. The DEP understands the criteria that apply for extending a socioeconomic variance and will submit complete documentation.

COMMENT P. *Bioassay Testing Methodologies.*

EPA has issued new versions of the two EPA documents listed in this section. EPA recommends that West Virginia amend its regulations to cite the most recent versions. The new documents are:

-Methods for Measuring Acute Toxicity (EPA-821-R-02-012, October 2002, 5th Edition)
-Short Term Methods for Estimating Chronic Toxicity of Effluents and Receiving Waters to Freshwater Organisms (EPA-821-R-02-013, October 2002, 4th Edition).

RESPONSE P. The DEP acknowledges the comment and will update the regulations in the next review period to indicate the most recent EPA documents concerning bioassay testing. The updating of this reference during the next update will allow the public a chance to review and comment if needed.

COMMENT Q. *Appendix A Category B-2 Trout Waters*

USEPA states that a number of streams were removed from the trout water list. Submission to USEPA for approval should include a use attainability analysis (UAA) covering each stream or stream segment that is being removed from the trout list. For streams that may have been erroneously designated as trout streams, a UAA could consist of data showing that the natural conditions (such as physical and chemical conditions) that prevent the water body from sustaining a year-round trout population have been present all along, and that those conditions are not subject to change.

RESPONSE Q. The DEP has removed the streams that were erroneously identified as trout streams. Reclassification forms will be submitted to the USEPA with the appropriate information for approval.

COMMENT R. *Coordination with the U.S. Fish and Wildlife Service (FWS)*

In February of 2001, EPA entered into a Memorandum of Agreement (MOA) with the FWS and the National Marine Fisheries Service (NMFS) regarding coordination under the CWA and the Endangered Species Act (ESA). We would appreciate your cooperation in meeting the spirit of these commitments under the MOA in order to expedite our 303(c) action once revisions to West Virginia's WQS rule are submitted for our review. While we recognize that this MOA does not bind the state, dischargers, construction projects and others who are individually responsible for compliance with the Endangered Species Act. West Virginia can assist EPA in meeting our commitment by facilitating early exchange of information with the FWS and helping in early identification of potential problems.

RESPONSE R. The DEP understands and is willing to help in any way to expedite the EPA review process.

XIX. COMMENTER: West Virginia Coal Association

COMMENT A. *Supports proposed revision of chronic aluminum criteria*

The commenter supports the proposed revision of the chronic aluminum criteria, and asks that the DEP consider the WVCA's original comments, provided in October 2005, with respect to the current rulemaking effort.

RESPONSE A. The DEP agrees that the proposed aluminum criteria are protective of the aquatic life designated uses. All comments provided by interested parties with respect to the proposed revision of the chronic aluminum criteria have been considered with respect to the current rulemaking effort.

COMMENT B. *DEP has proposed a massive expansion of trout stream listings without providing adequate time for the regulated community to review and analyze the data.*

The commenter states that DEP has repeated one of the EQB's blunders by failing to provide the regulated community with adequate time to review the supplied information. The commenter states that the initial information and data supplied by DEP in response to its FOIA request dated 5/08/06 was received 12 days after the agency published its proposed rule for public comments. The commenter further states that the DEP provided follow up data a mere 20 calendar days before the July 17, 2006 close of comments. The commenter urges the agency to further extend the review and comment period regarding the trout stream expansion, and that minus an extension, the proposed expansion is no more defensible than the earlier, similar initiative proposed by the EQB.

RESPONSE B. The DEP is obligated by statute to provide a minimum of 30 days for public comment on a proposed rule. The maximum allowable comment period is 60 days. DEP chose a 45-day public comment for the proposed Water Quality Standards rule, which is greater than the minimum requirement. In responding to the FOIA request dated 5/08/2006, the DEP had to work with the DNR in its Elkins office to assemble all of the pertinent information. The information had to be sorted, scanned, and placed on CD's for ease of distribution to those persons who had requested the information. This was all done by the DEP in a matter of a few days so that the data could be distributed as quickly as possible to interested parties. This process also kept the interested parties from having to come to the DEP headquarters and manually sort through a large box of hard-copy data. The data was available 12 days into the comment period, which left 33 days for review, a time period still greater than the minimum requirement. Additional data on 49 streams was provided at a later date, approximately 20 days before the end of the comment period. The additional data represented only about 10% of the total amount. Thus, 20 days should have been an adequate time to review the small amount of additional data.

The DEP does not believe an extension of the public comment period is necessary, and has not received additional requests to do so. The list is defensible and the data provided by the DNR constitutes adequate documentation for streams appearing on the list. Moreover, the DEP is required by statute to file an agency-approved rule with the Legislature by July 28, 2006.

XX. COMMENTER: Bright Enterprises

COMMENT A. *Implications of expanding list of "trout waters" have not been adequately analyzed, considered, or explained by DEP.*

The commenter states that the dramatic expansion of listed "trout waters" is a major public policy issue for the State, and one whose intent has not been adequately explained by DEP. Commenter claims that his company is in the dark about DEP's public policy intent for this proposal. Further, commenter states that listing the additional trout waters in Appendix A of 47CSR2 is premature, and should be withdrawn and reconsidered.

RESPONSE A. The DEP agrees that the designation of trout waters is a major public policy issue, but does not agree that the rule revisions reflect a change in policy. It also does not agree

that the intention behind the rule changes has not been adequately explained. Simply stated, section 2.19 of proposed 47CSR2 defines "trout waters" as waters that sustain year-round trout populations. Appendix A provides a representative list of streams that are designated as trout waters and has been in the rule, without updates, for over 20 years. These streams are protected by criteria specific to the trout waters designated use (category B2 of criteria). The new proposed list is more comprehensive than any of the lists provided in previous versions of the standards. Not having a comprehensive, accurate list has put the agency in the position of having to consult sources other than the rule to accurately determine which waters are trout waters. The DEP would prefer to rely upon a list that is officially promulgated. It does not believe that the new listing is premature; in fact, based on the age of the list, it is long overdue.

COMMENT B. *If streams are removed from the Tier 2.5 list, then they shouldn't be subsequently included in Appendix A.*

The commenter suggests that much of the data used to support Tier 2.5 stream designations was extremely limited and out of date, and such data aren't adequate to make significant regulatory decisions. Commenter claims to have been surprised when the DEP added the same streams to Appendix A based on the same data.

RESPONSE B. It is apparent to DEP that many parties have confused the intent of the Tier 2.5 list and process with that of the water quality standards process and the listing of trout waters in Appendix A. The purpose of the Tier 2.5 (antidegradation) process is to protect the existing water quality of a select group of streams the state believes have unique value and outstanding water quality. All naturally reproducing trout waters were originally placed on the proposed list because of their unique nature and outstanding water quality. Many trout streams have since been removed from the list for various reasons, including planned or ongoing development, and the fact that some of the streams did not have adequate documentation that trout reproduction was occurring. However, the streams removed from the Tier 2.5 list for reasons mentioned above may and indeed must be classified as trout waters if they can sustain trout year-round. All streams placed in Appendix A meet the definition of either naturally reproducing or support trout year-round as stated in the rule.

COMMENT C. *Bright Enterprises objected to Tier 2.5 listing for several streams.*

Bright Enterprises objected to the streams listed below because of concerns about the effects of such listings on its properties and businesses, but also because the company believes the data cited by the DEP were inadequate and deficient. Each of these streams is now on the proposed Appendix A "trout waters" list.

Big Run of Red Creek of Dry Fork, Randolph County (MC-60-O-1)
Red Creek of Dry Fork, Tucker and Randolph Counties (MC-60-O)
Dry Fork, Tucker County (MC-60)
Spruce Run of Dry Fork, Randolph County (MC-60-P)
Difficult Creek of North Branch Potomac River, Grant County (PNB-18)
Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB-16-B)
Wycroff Run of Johnnycake Run of Abram Creek of North Branch Potomac River, Grant County (PNB-16-B-1)

Glade Creek of (Lower) New River, Raleigh County (KN-29)
Pinch Creek of Glade Creek of (Lower) New River, Raleigh County (KN-29-E)
Rockcamp Run of Buffalo Creek of Elk River, Clay County (KE-50-I)
Piney Creek of (Lower) New River, Raleigh County (KN-26)

RESPONSE C. The fact that some of the streams mentioned above may run through private property does not diminish the fact that they are trout waters. Four of the streams mentioned are on the current Appendix A trout list: Red Creek, Dry Fork, Glade Creek and Pinch Creek. The stream surveys for these streams show many trout present, in some cases over multiple surveys. All streams show the presence of a trout population. The DEP believes that these streams, which are listed in Appendix A, have adequate documentation to support that a year-round trout population exists.

COMMENT D. *No federal mandate exists to afford trout waters special protection*

The commenter refers to the Briefing Document for the proposed rule 47CSR2, specifically the section entitled "Statement of Circumstances Which Require Rule". The commenter states that this section fails to identify anything that could be construed as a "requirement". No federal or other mandate compels West Virginia to specifically identify "trout waters" or to afford them protections in excess of those that are adequate for other streams.

RESPONSE D. The federal Clean Water Act and regulations at 40 CFR Part 131 require the state to "...specify appropriate water uses to be achieved and protected. The classification of the waters of the State 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, agriculture, industrial and other purposes including navigation." See 40 CFR §131.10 Also, states may adopt subcategories for a use and set appropriate criteria to protect those subcategories, for example to differentiate between coldwater and warmwater fisheries. West Virginia adopted the subcategory of "trout waters" in 1970 along with criteria to protect that use. Once a state establishes a designated use in its standards and supplies a list of waters to which that use applies, it is responsible for ensuring that the list is updated and accurate. In proposing to add 337 streams to the list, the DEP is responding to a long-standing concern that the existing list of trout waters is outdated and does not reflect the true extent of the resource.

COMMENT E. *DEP should define the public policy purposes and implications of "trout waters" listings.*

The commenter believes that the DEP should explain to the public, affected property owners, local governments, and businesses the public policy purposes and implications of "trout waters" listings, and why it is appropriate and sound policy.

RESPONSE E. The DEP believes that the "trout waters" designated use, definition, and purpose are adequately explained in the proposed Water Quality Standards Rule, 47CSR2, and the associated Briefing Document.

COMMENT F. *Appendix A will be used to backdoor streams into Tier 2.5*

The commenter expects that a listing as an Appendix A "trout water" will eventually be used, as an alleged validation of the underlying trout data, to support back door attempts to regulate such streams under Tier 2.5.

RESPONSE F. The DEP reiterates that the process and purpose behind the establishment of the Tier 2.5 list and the Appendix A list are totally separate. If a stream meets the definition of "trout waters," it will be placed in Appendix A. This fact has no bearing on the Tier 2.5 process.

COMMENT G. *Many streams on the list are too small to serve as viable fisheries or on private land and not accessible to the public.*

The commenter states that many of the streams on the proposed "trout waters" list are too small to serve as viable fisheries. Further, the full lengths of many streams, and much of the length of many others, are located within private properties and are not legally accessible for fishing.

RESPONSE G. The size and location of a stream has no bearing on whether it is capable of sustaining trout year-round. Nor is it relevant that a stream is located adjacent to private property. Further, whether a stream serves as a viable or commercial fishery is not relevant to its status as a "trout water."

COMMENT H. *The DEP should explain its rationale if it is affording special protection to streams "just because they are there."*

The commenter states that if the DEP sees it as appropriate to afford special protection to streams supporting year round trout populations "just because they are there", with no regard to the ancillary impacts of such designations, then the DEP should explain its rationale as such.

RESPONSE H. The entire concept of protecting "trout waters" is based upon the establishment of a trout stream designated use in the Water Quality Standards Rule, 47CSR2. As required by the federal Clean Water Act, the state has established designated uses for all of its waters, and must protect those uses with appropriate criteria. If streams are found to support trout year-round, they qualify for protection under the definition of "trout waters." Ancillary impacts have no bearing on whether a stream that definition. It is strictly a scientific determination.

COMMENT I. *The public needs and deserves to have the rationale behind the "trout waters" concept clearly explained*

The commenter states that the rationale behind the DEP's decision to drastically expand the trout waters list should be clearly described to the public. The list should not be automatically perpetuated and expanded by the DEP without the agency first thinking through and explaining why it believes this is the right thing to do from the public policy standpoint

RESPONSE I. The DEP reiterates that the rationale behind the trout waters list is adequately explained in the proposed Water Quality Standards Rule, 47CSR2, and the accompanying Briefing Document. In addition, the trout list concept paper, published on the DEP's web site, www.dep.state.org, further describes the concept behind the list of trout waters.

COMMENT J. *No streams should be added to the list until the consequences are explained to the public.*

The commenter states that if upon thorough consideration the DEP determines that the existing rules and definitions pertaining to "trout waters" do not correctly reflect appropriate public policy purposes, and that unintended consequences are therefore likely, the rules need to be corrected. The public deserves to know why the DEP believes its action is appropriate.

RESPONSE J. The DEP believes that the commenter may be confusing the purpose behind establishing a list of trout waters in Appendix A of 47CSR2 with the concept of Tier 2.5. The DEP did consider the factors mentioned above with respect to establishing a list of streams for Tier 2.5 protection (see Response to Comments XX. B). The rationale behind the establishment of Appendix A is explained in Response to Comments XX.H and XX. D.

XXI. COMMENTER: American Electric Power (AEP)

COMMENT A. *Support of Chamber of Commerce comments.*

On behalf of AEP, I am filing comments on the above regulation supporting the comments being presented by the West Virginia Chamber of Commerce on this same regulation. As a member of the Chamber Water Sub-committee, AEP participated in the development of the Chamber's comments and incorporate their submittal by reference.

RESPONSE A. See Comments and Response to Comments for Chamber of Commerce, Commenter XVI.

XXII. COMMENTER: Mr. Philip Smith

COMMENT A. *The definition of "trout waters" and the B2 trout list.*

The commenter recommends that we retain the definition of "trout waters" as defined in the proposed rule to protect and maintain the genetic flow on the secondary watersheds.

RESPONSE A. See Response to Comment I. A above.