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

Ms. Allyn Turner, Director
Division of Water Resources
West Virginia Department of Environmental Protection
1201 Greenbrier Street
Charleston, West Virginia 25311

Dear Ms. Turner:

According to the Consent Decree (entered by the United States District Court for the southern District of West Virginia on July 9, 1997) and Settlement Agreement for the case OVEC Inc.,et al., V. Browner, et al., the Environmental Protection Agency (EPA) has established final Total Maximum Daily Loads (TMDLs) for 205 waterbodies including the Tug Fork River and 63 tributaries, the West Fork River and 98 tributaries, Monongahela River and 37 tributaries, Dunloup Creek and one tributary, Fourpole Creek, and the Ohio River. The TMDLs are for mine-drainage impaired waterbodies in watersheds of the Tug Fork River, West Fork River, Monongahela River, Dunloup Creek, and Fourpole Creek and for polychlorinated biphenyls impairments in the Ohio River. EPA has established these TMDLs to satisfy its obligation of Joint Notice of Modification of Consent Decree to extend Deadline entered into and filed in March 1999.

In accordance with Federal regulations found in 40 CFR §130.7, a TMDL must: (1) be designed to meet water quality standards, (2) include, as appropriate, both wasteload allocations for point sources and load allocations for nonpoint sources, (3) consider the impacts of background pollutant contributions, (4) take critical stream conditions into account (the conditions when water quality is most likely to be violated), (5) consider seasonal variations, (6) include a margin of safety (which accounts for any uncertainties in the relationship between pollutant loads and instream water quality), (7) reasonable assurance that the TMDLs can be met and, (8) be subject to public participation. The decision rationales for each TMDL describe how each TMDL satisfies all statutory and regulatory requirements.

The West Virginia Department of Environmental Protection shall incorporate these TMDLs into the State's Water Quality Management Plan pursuant to 40 CFR §130.7(d)(2). As you know, any new or revised National Pollution Discharge Elimination System permits with applicable effluent limits must be consistent with the TMDL's wasteload allocation pursuant to 40 CFR §122.44(d)(1)(vii)(B)(2). Any such permit should be submitted to EPA for review consistent with EPA's letter dated October 1, 1998.

Enclosed, please find a copy of the final TMDL reports for the Tug Fork River, West Fork River, Monongahela River, Dunloup Creek, Fourpole Creek, and the Ohio River, along with EPA's decision rationales. A compact disk with these final TMDLs will be sent within the near future. These final TMDLs will also be available on our web site http:/www.epa.gov/reg3wapd/tmdl/.

If you have any questions concerning the final TMDLs, please contact Ms. Jennifer Sincock, West Virginia TMDL Coordinator at (215) 814-5766 or Mr. Thomas Henry, TMDL Program Coordinator at (215) 814-5752.

Sincerely,

Jon M. Capacasa, Acting Director
Water Protection Division

Enclosures

cc: Mr. Patrick Campbell, Assistant Director, Division of Water Resources
Ms. Ryan Alexander, Esquire
Ohio Valley Environmental Coalition
West Virginia Highlands Conservancy
Appalachian Research and Defense Fund, Inc.
Mr. David L. Yaussy, Esquire
Mr. David M. Flannery, Esquire
Mr. Jeffrey K. Towner, U.S. Fish and Wildlife Service, West Virginia

Metals, pH and Fecal Coliform Bacteria Total Maximum Daily Loads (TMDLs) for the Dunloup Creek Watershed, West Virginia

U.S. Environmental Protection Agency
Region III
1650 Arch Street
Philadelphia, PA 19103-2029

September 2002

Signed
Jon M. Capacasa, Acting Director
Water Protection Division

9/30/02
Date

Decision Rationale
Total Maximum Daily Loads
Dunloup Creek Watershed
For Metals, pH and Fecal Coliform Bacteria Affected Segments

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those water bodies identified as impaired by the state where technology-based and other controls did not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a margin of safety (MOS), that may be discharged to a water quality-limited water body.

This document sets forth the U. S. Environmental Protection Agency's (EPA) rationale for establishing the TMDLs for metals, pH and fecal coliform bacteria in the Dunloup Creek watershed. The TMDL was established to address impairment of water quality as identified in West Virginia's 1996 and 1998 Section 303(d) list of impaired waters.

The following regulatory requirements were considered in establishing the Dunloup Creek watershed TMDLs:

1. The TMDLs are designed to implement the applicable water quality standards.
2. The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.
3. The TMDLs consider the impacts of background pollutant contributions.
4. The TMDLs consider critical environmental conditions.
5. The TMDLs consider seasonal environmental variations.
6. The TMDLs include a margin of safety.
7. There is reasonable assurance that the proposed TMDLs can be met.
8. The TMDLs have been subject to public participation.

From this point forward, all references in this approval rationale are found in the TMDL Report, *Metals, pH, and Fecal Coliform Bacteria TMDLs for the Dunloup Creek Watershed, West Virginia.*

II. Summary

Table 1-5 presents the 1996 and 1998 Section 303(d) listing information for the two water quality-limited segments of Dunloup Creek watershed including 9.2 miles of the Dunloup Creek main stem (from the headwaters to Glen Jean) and the entire length of the Meadow Fork (four miles). The main stem Dunloup Creek is listed for aluminum and the Meadow Fork is listed for pH and metal impairments including total iron, aluminum, and manganese, which have been attributed to mine drainage. Generally, the mine drainage entering Dunloup Creek is not acid mine drainage except for small quantities discharging to Meadow Fork. Although Dunloup Creek is not listed for iron or fecal coliform bacteria, recent monitoring disclosed an iron and a fecal coliform bacteria impairment to Dunloup Creek. For this reason, Dunloup Creek is likely

to be included on West Virginia's draft 2002 Section 303(d) list for iron and fecal coliform bacteria impairments. West Virginia Department of Environmental Protection (WVDEP) took advantage of the ongoing modeling and analysis efforts being used for the aluminum TMDL and the iron and fecal coliform bacteria TMDLs were also developed for the Dunloup Creek main stem. These TMDLs represent the two listed segments in the Dunloup Creek River watershed.

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically-based strategy which considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. Conditions, available data, and the understanding of the natural processes can change more than anticipated by the MOS. The option is always available to refine the TMDL for re-submittal to EPA for approval.

The summary TMDL Tables 5-2 and 5-3 for the Dunloup Creek watershed and the Meadow Fork Creek, respectively, present the allowable load allocation for nonpoint sources, the allowable waste load allocation for point sources, and the TMDLs for aluminum, iron, manganese, and fecal coliform bacteria. The metal loads are in pounds per year and the fecal coliform bacteria is in counts per year which may be divided by 365 days per year to express the TMDL in pounds/counts per day. The WLA for point sources are presented in Appendix A in Tables A-3, A-6, A-9, and A-12 for aluminum, iron, manganese, and fecal coliform bacteria, respectively. In addition to the WLA as an average annual load, the WLA in mg/L for metals and counts/mL for fecal coliform bacteria are also presented which should be used to develop permit limits using the procedures in EPA's *Technical Support Document for Water Quality-based Toxics Control*, March 1991.

III. Background

The Dunloup Creek watershed is a small watershed located in Fayette and Raleigh Counties, part of the New River Basin [HUC 05050004] in West Virginia (Figure 1-1). The approximately 47 square mile watershed is located to the west of the New River Gorge National Park and is characterized by steep, rugged terrain that is heavily forested. From its headwaters, Dunloup Creek flows in a northeasterly direction to its confluence with the New River just south of Thurmond, West Virginia. The New River then flows northwest and joins the Gauley River to form the Kanawha River and eventually flows into the Gulf of Mexico via the Ohio and Mississippi Rivers. The Dunloup Creek is popular with anglers and is stocked with trout by the West Virginia Division of Natural Resources, once a month from February through May.

The Dunloup Basin lies in the southern coalfields of West Virginia, where extensive deposits of coal have historically represented the most economically valuable mineral resource in the Dunloup Creek watershed. Coal mining played a significant role in the regional economy from the late 1800s to the early 1900s. While production from the area decreased substantially during and after the years of the Great Depression, coal continues to be mined in the watershed.

Before the implementation of the West Virginia Surface Coal Mining and Reclamation Act and the Surface Mining Control and Reclamation Act (SMCRA), little consideration was given to the environmental degradation that resulted from these activities. Currently, the quality of the

Dunloup Creek and its tributaries are being negatively impacted by drainage from mines that were abandoned prior to these environmental regulations.

Historical data also indicate sewage contributions to high fecal coliform bacteria levels in the Dunloup Creek. Potential fecal coliform bacteria sources are discussed in Sections 3.4.1, 3.5, 4.3.3, and 4.3.5.

The Dunloup Creek watershed was divided into 42 subwatersheds representing hydrologic boundaries, shown in Figure 4-1. The 42 subwatersheds provided a basis for georeferencing pertinent source information and monitoring data, and for presenting TMDLs. The Mining Data Analysis System (MDAS) was used to represent the source-response linkage in the Dunloup Creek watershed for aluminum, manganese, iron and fecal coliform. The MDAS is a comprehensive data management and modeling system that is capable of representing loads from nonpoint and point sources found in the watershed and simulating in-stream processes. The MINTEQ modeling system was used to represent the source-response linkage in the Dunloup Creek watershed for pH.

These TMDLs were established by EPA to fulfill requirements of the 1997 TMDL lawsuit settlement agreement. The 1997 consent decree requires that West Virginia or EPA, if West Virginia fails to, develops TMDLs for 44 priority waters included on West Virginia's 1996 Section 303(d) list by September 30, 2002. The Dunloup Creek main stem is a priority water quality limited segment. In addition, the consent decree required a total of 350 waters impacted by mine drainage to have TMDLs completed by March 31, 2006.

Computational Procedure

Because of the lack of flow measurements within the Dunloup Creek watershed, Peters Creek watershed located northeast of Dunloup Creek with 1996-1998 flow data was used to calibrate the hydrologic model. The drainage area, topography, and land uses of Peters Creek, located near Summersville, West Virginia, are similar enough to Dunloup Creek to serve as an appropriate reference watershed for hydrology calibration purposes.

Section 3.0 of the TMDL Report discusses data sources, point and non-point sources of mine drainage and fecal coliform bacteria. Generally, mine drainage point sources are permitted mining operations and mine drainage non-point sources are pre-SMCRA sources such as abandoned mine lands (AMLs) and discharges from abandoned deep mines. Section 3.4.2 identifies one active mining point source, the Sun Mountain Surface Mine (Article 3 permit ID - S301699WV1019201). Information from WVDEP indicates that all revoked permits in the Dunloup Creek watershed have been reclaimed or are in the final few months of reclamation. See Appendix B for a list of mining permits in the Dunloup Creek watershed. Section 3.5.1 identifies a link between metals and AMLs in the Dunloup Creek watershed. There are five known mine discharges, considered to be AML, that contribute to the stream flow in the Dunloup Creek. Discharges from AML lands are primarily responsible for water quality impairments due to metals and pH in the Dunloup Creek watershed. Reductions of metals and pH to the watershed will require a reduction in the AML load. Tables A-2, A-5, and A-8 in Appendix A divides the load allocation (LA) according to land use for aluminum, iron, and manganese, respectively. Reductions were not made to any permitted point source. Tables A-3,

A-5, and A-8 in Appendix A present the waste load allocation for the one active permitted mining point source.

Section 3.0 identifies the potential sources of fecal coliform bacteria including straight pipes, leaking or failing sanitary sewers, runoff from urban and residential areas, and runoff from crop and pasture lands. Section 3.4.1 identifies two facilities that are permitted to discharge fecal coliform bacteria into Dunloup Creek. These are the City of Mount Hope Sewerage System (WV0021776) and the White Oak PSD (WV0044041). Failing septic systems are a common source of fecal coliform bacteria due to the steep terrain and soil in the Dunloup Creek watershed. Another major source of fecal coliform bacteria to the Dunloup Creek watershed is the use of straight pipes for household wastewater and sewage removal. The City of Mount Hope Facilities Plan indicates there are approximately 150 homes in the Kilsyth and Price Hill communities, upstream of Mt. Hope, using straight pipes. An additional 200 homes in the Mount Hope vicinity (including structures within and adjacent to the corporate city limits) are unsewered. Discharges from straight pipes and failing septic systems are primarily responsible for water quality impairments due to fecal coliform in the Dunloup Creek watershed. Reductions of fecal coliform bacteria to the watershed will require a reduction in the failing septic system and straight pipe load. Table A-11 in Appendix A divides the load allocation according to land use for fecal coliform bacteria. Reductions were not made to any permitted point source. Table A-12 in Appendix A presents the waste load allocation for the two permitted point sources.

Section 4.0 discusses the technical approach, data sources, and application of the Mining Data Analysis System (MDAS) model for metals and fecal coliform bacteria sources. The parameter, pH, cannot be modeled as readily as can the metals. It is assumed that implementation of TMDLs in the Dunloup Creek watershed for metals will result in instream metals concentrations meeting water quality standards. Compliance with the pH water quality standards is demonstrated by the use of MINTEQA2 model. MINTEQA2 is a geochemical equilibrium speciation model. By inputting into the MINTEQA2 model the dissolved concentrations of metals, a pH value can be predicted.

IV. Discussions of Regulatory Requirements

EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA policy and guidance. EPA's rationale for establishing these TMDLs is set forth according to the regulatory requirements listed below.

1. The TMDLs are designed to implement the applicable water quality standards.

The listed waterbodies in the Dunloup watershed (including Meadow Fork) have been designated as having an Aquatic Life and a Human Health use (WVDEP, 1998a). The portion of Dunloup Creek downstream from Harvey, West Virginia, is designated trout waters and must meet the Aquatic Life B2 criteria. The portion of Dunloup Creek above Harvey, West Virginia, has an Existing Use of B2 - Trout Waters because brown trout of various age classes have been reported to be resident year-round in several locations upstream of Harvey, West Virginia. This satisfies the definition of Trout Waters in Section §46-1-2.19. The applicable water quality criteria are shown in Table 2-1.

2. The TMDLs include a total allowable load as well as individual waste load allocations and load allocations.

A TMDL is the total amount of a pollutant that can be assimilated by the receiving water while still achieving water quality standards. TMDLs can be expressed in terms of mass per time or by other appropriate measures. TMDLs are comprised of the sum of individual wasteload allocations (WLA) for point sources, LA for nonpoint sources, and natural background levels. In addition, the TMDL must include a MOS, either implicitly or explicitly, that accounts for the uncertainty in the relationship between pollutant loads and the quality of the receiving stream. Conceptually, this definition is denoted by the following equation.

TMDL = Summation of WLA + Summation of LA + MOS

For purposes of these TMDLs only, mine drainage point sources are identified as permitted discharge points including active mining sites and non-mining sites. Mine drainage nonpoint sources are discharges from abandoned and reclaimed mine lands which includes such things as tunnel discharges, seeps, and surface runoff. Abandoned and reclaimed mine lands were treated in the allocations as nonpoint sources because there are no National Pollutant Discharge Elimination System (NPDES) permits associated with these areas. As such, the discharges associated with these land uses were assigned load allocations (as opposed to wasteload allocations). The decision to assign load allocations to abandoned and reclaimed mine lands does not reflect any determination by EPA as to whether there are unpermitted point source discharges within these land uses. In addition, by approving these TMDLs with mine drainage discharges treated as load allocations, EPA is not determining that these discharges are exempt from NPDES permitting requirements.

For purposes of these TMDLs only, fecal coliform bacteria point sources are identified as permitted discharge points including public sewage systems. Fecal coliform bacteria nonpoint sources are discharges from failing septic systems, straight pipes, mining related, natural land uses, and urban land uses.

Tables 5-2 and 5-3 for the Dunloup Creek watershed and the Meadow Fork Creek, respectively, present the LAs, WLAs, MOS, and TMDLs for aluminum, iron, manganese, and fecal coliform bacteria. Tables A-3, A-6, A-9, and A-12 in Appendix A present the WLAs for each subwatershed for aluminum, iron, manganese, and fecal coliform bacteria, respectively. Tables A-2, A-5, A-8, and A-11 in Appendix A present the LAs for each subwatershed for aluminum, iron, manganese, and fecal coliform bacteria, respectively.

3. The TMDLs consider the impacts of background pollutant contributions.

MDAS considers background pollutant contributions in that all land uses are modeled. Table 4-2 identified the land uses considered and Tables 4-4 presents land uses by subwatershed.

4. The TMDLs consider critical environmental conditions.

Critical conditions were considered while considering seasonal variations, by running the daily simulation model for several years, from 1996 to 2002.

5. The TMDLs consider seasonal environmental variations.

See Requirement 4 above.

6. The TMDLs include a margin of safety.

The CWA and Federal regulations require TMDLs to include a MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA's guidance suggests two approaches to satisfy the MOS requirement. First, it can be met implicitly by using conservative model assumptions to develop the allocations. Alternately, it can be met explicitly by allocating a portion of the allowable load to the MOS.

An implicit MOS was included by setting the modeling endpoints to 95 percent of the water quality standards, Section 5.1.6.

7. There is reasonable assurance that the proposed TMDLs can be met.

Section 6.0 addresses reasonable assurance. There are two primary programs in effect which provide reasonable assurance that the TMDLs will be implemented. Section 6.2.1 discusses the duties of the Office of Abandoned Mine Lands and Reclamation and Section 6.2.2 discusses the duties of the Special Reclamation Group. Adequate funding for reclaiming abandoned mine lands is an issue to be addressed.

In addition, the next round of NPDES permitting will require that permit limits reflect the individual WLAs. The WLAs will be converted to permit limits using the procedures of EPA's *Technical Support Document for Water Quality-based Toxics Control* (EPA, 1991).

Section 6.3 discusses reasonable assurance for fecal coliform bacteria source reductions. These include providing sewage collection systems to unsewered communities and improvement to the existing collection and treatment system in order to effectively treat the increased loading.

8. The TMDLs have been subject to public participation.

Section 8.0 describes the public participation which included an informational TMDL 101 meeting, a 35-day public comment period, and a public informational meeting.