Decision Rationale
Total Maximum Daily Loads of
Metals, Ammonia, and pH TMDLs
for the Stony River Watershed, West Virginia

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) to 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, that may be discharged to a water quality-limited water body.

This document will set forth the Environmental Protection Agency's (EPA) rationale for establishing the Total Maximum Daily Loads (TMDLs) of Metals, Ammonia, and pH for the Stony River watershed. EPA's rationale is based on the determination that the TMDLs meet the following eight regulatory conditions pursuant to 40 CFR §130.

1) The TMDLs are designed to implement 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 TMDLs can be met.
8) The TMDLs have been subject to public participation.

II. Background

Stony River watershed is located almost entirely in Grant County, which lies in northern West Virginia. The River drains a 58.8 square mile watershed. The watershed can be broken down into several landuses. Forest and agricultural lands makeup roughly 79% the of watershed. There are active surface and deep mining operations throughout the watershed. Mount Storm, which is located in the lower part of the basin, is the only town in the watershed.

This TMDL Report addresses the impairment of the aquatic life use on the Stony River, Laurel Run, Four-mile Run, and Helmick Run. On the 1998 Section 303(d) list, the pollutants of concern were identified as metals and/or pH for all of these segments. Acid mine drainage (AMD) was identified as the source of these impairments.

In 1998, unionized ammonia was listed as an additional pollutant of concern for Stony River. Based on updated data, this issue appears to have been an isolated problem associated with a facility in the watershed. Recent data show that the impairment no longer exists.

Therefore, the TMDL does not address unionized ammonia loadings.

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 margin of safety value. Conditions, available data , and the understanding of the natural processes can change more than anticipated by the margin of safety. The option is always available to refine the TMDL for re-submittal to EPA for approval.

Tables 5.2, 5.3, and 5.4 document the Waste Load Allocations (WLAs) and Load Allocations (LAs) for each parameter for each watershed.

Table 5-2. Load and waste load allocations for aluminum

Region	Stream Name	List ID	LAs (lbs/yr)	WLAs (lbs/yr)
1	Four Mile Run	PNB-17-C	1,245	2,364
1	Laurel Run	PNB-17-B.5	1,573	574
1	Stony River	PNB-17	16,063	11,730
2	Helmick Run	PNB-17-E	2,123	2,142
2	Laurel Run	PNB-17-D	2,471	0
2	Stony River	PNB-17	4,038	2,515

Table 5-3. Load and waste load allocations for iron

Region	Stream Name	List ID	LAs (lbs/yr)	WLAs (lbs/yr)
1	Four Mile Run	PNB-17-C	1,618	5,012
1	Laurel Run	PNB-17-B.5	2,044	3,966
1	Stony River	PNB-17	21,066	14,933
2	Helmick Run	PNB-17-E	2,751	5,901
2	Laurel Run	PNB-17-D	4,511	0
2	Stony River	PNB-17	5,708	5,695

Table 5-4. Load and waste load allocations for manganese

Region	Stream Name	List ID	LAs (lbs/yr)	WLAs (lbs/yr)
1	Four Mile Run	PNB-17-C	887	8,032
1	Laurel Run	PNB-17-B.5	1,101	7,616
1	Stony River	PNB-17	11,788	21,630
2	Helmick Run	PNB-17-E	1,459	8,855
2	Laurel Run	PNB-17-D	5,652	0
2	Stony River	PNB-17	3,268	5,858

III. Discussion of Regulatory Conditions

EPA find that sufficient information has been provided to meet all of the requirements for establishing a TMDLs for the Stony River watershed. EPA's decision is outlined according to the regulatory requirements listed below.

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

The TMDLs were developed using the Mining Data Analysis System (MDAS). MDAS was specifically designed to support TMDL development on AMD impacted waters. The river was divided into subwatersheds, based on elevations and stream connectivity, for the modeling effort. Each subwatershed was broken-up into several land-uses. The land-use coverage provided the basis for estimating and distributing total aluminum, iron, and manganese loadings associated with conventional land-uses. Weather data were obtained from weather stations located at Elkins WSO Airport, Moorefield 1 SSE, and Terra Alta No 1. Non-mining point sources were not considered for the model.

All permitted mining point sources were accounted for in the model unless they were phase II or completely released facilities. It was felt that phase II and completely released facilities were not impacting water quality since the reclamation was nearly complete. The model was designed insure compliance with the applicable numeric standards. The end points were more stringent than the numeric standards for iron, aluminum, and manganese, due to an explicit 5% margin of safety. For additional information on the modeling process please see section 4.0 of the TMDL Report.

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 waste load allocations (WLA) point sources, load allocations (LA) for non-point sources, and natural background levels. In addition, the TMDL must include a margin of safety (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.

$$TMDL = \sum WLA + \sum LA + MOS$$

Total Allowable Loads

A total allowable loading was determined for each of the parameters (aluminum, iron, and manganese) for each of the listed segments in this TMDL. The total allowable load is the

sum of the WLA, LA, and Margin of Safety (MOS).

Waste load Allocations

A WLA was developed for all mining permits except those associated with phase II or completely released facilities. A WLA was derived for each parameter for each facility. Table 4a, 4b, and 4c of appendices A-1 and A-2 of the TMDL report, document the WLA for each permitted facility. For additional information on WLAs please see section 5.4.1 of the TMDL report.

Load Allocations

According to federal regulations at 40 CFR 130.2(g), load allocations are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible natural and nonpoint source loads should be distinguished.

Load allocations were developed for the dominant source categories. These source categories were abandoned mine lands, other nonpoint sources, and revoked permits. The load allocations were presented as annual loads in pounds per year for each parameter. Tables 5a, 5b, and 5c located in Appendices A-1 and A-2 of the report documents the load allocations for abandoned mine lands, nonpoint sources, and revoked permits.

For purposes of these TMDLs only, point sources are identified as permitted discharge points from active mining sites and 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.

3) The TMDLs consider the impacts of background pollutants.

Background conditions were considered in the modeling of these TMDLs, through the nonpoint source loading associated with forested lands.

4) The TMDLs consider critical environmental conditions.

Both wet and dry weather sources are impacting the Stony River Watershed. By using a

continuous simulation to model the TMDLs, a wide array of loading and hydrologic patterns were considered by the model.

5) The TMDLs consider seasonal environmental variations.

Seasonal environmental variations were considered by modeling the TMDLs with observed weather data over an extended period of time. For additional information on seasonal variation please see section 5.4.4 of the TMDL Report.

6) The TMDLs include a margin of safety.

An explicit Margin of Safety (MOS) has been included in the TMDL. The MOS is equal to 5% of the water quality standard. For additional information on the MOS, please see section 5.1.3 of the TMDL report.

7) There is a reasonable assurance that the TMDL can be met.

West Virginia Department of Environmental Protection's (WVDEP) efforts in reclaiming abandoned mine sites and its responsibilities and duties under the NPDES program provide a reasonable assurance that the TMDLs can be implemented. Reclaiming abandoned mine sites has been hampered by inadequate funding, however, and this is an issue which requires attention.

8) *The TMDLs have been subject to public participation.*

A public hearing was held on August 29, 2001 for these TMDLs. There was a 45-day comment period for the TMDLs as well. The public comment period was held from July 16, 2001 to August 30, 2001.