



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

Decision Rationale
Total Maximum Daily Loads for
Selected Streams in the Gauley River Watershed
West Virginia

Signed

Jon M. Capacasa, Director
Water Protection Division

Date: 3/27/2008

Decision Rationale
Total Maximum Daily Loads for Selected Streams
in the Gauley River Watershed, West Virginia

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) to be developed for those waterbodies identified as impaired by a 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), which may be discharged to a water quality limited waterbody.

This document will set forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for total iron, dissolved aluminum, pH, total selenium, fecal coliform bacteria and/or biological impairments on selected waterbodies in the Gauley River Watershed. The TMDLs were developed to address impairment of water quality as identified in West Virginia's 1996, 1998, 2002, 2004, and 2006 Section 303(d) Lists of impaired waters. EPA's rationale is based on the determination that the TMDLs meet the following seven regulatory conditions pursuant to 40 CFR §130.

1. The TMDL is designed to implement applicable water quality standards.
2. The TMDL includes a total allowable load as well as individual wasteload allocations (WLAs) and load allocations (LAs).
3. The TMDL considers the impacts of background pollutant contributions.
4. The TMDL considers critical environmental conditions.
5. The TMDL considers seasonal environmental variations.
6. The TMDL includes a MOS.
7. The TMDL has been subject to public participation.

In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

From this point forward, all references in this approval rationale are found in West Virginia's TMDL Report *TMDLs for Selected Streams in the Gauley River Watershed, West Virginia* (TMDL Report), unless otherwise noted.

II. Summary

Table 3-3 of the TMDL Report presents the waterbodies and impairments for which TMDLs have been developed for the Gauley Watershed by the West Virginia Department of Environmental Protection (WVDEP). The 106 waterbodies were identified on West Virginia's 2006 Section 303(d) List. TMDLs were developed for some combination of total iron, dissolved aluminum, pH, total selenium, fecal coliform bacteria and/or biological impairments on 106 waterbodies. These TMDLs represent 89 of the 105 waterbodies in the Gauley River Watershed that were identified on the 2006 Section 303(d) List. An additional 17 segments were identified

as impaired through pre-TMDL sampling and were included in this TMDL Report. The remaining segments on the 2006 Section 303(d) List were not included because they were either newly listed waters or the biological stressor identification did not singularly identify a causative pollutant. All waters and impairments excluded from TMDL development in this effort will remain on West Virginia's Section 303(d) List and will have TMDLs developed in 2011 or 2016 in accordance with West Virginia's Watershed Management Framework.

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 TMDLs for re-submittal to EPA for approval.

The subwatershed appendices provide additional details relative to their respective impaired waters and the applicable TMDLs (sum of wasteload allocations + sum of load allocations + margin of safety). Each subwatershed appendix presents applicable TMDLs for total iron, dissolved aluminum, total selenium, net acidity, or fecal coliform bacteria, as appropriate. Allocation spreadsheets also provide applicable TMDLs, WLAs to individual point sources and LAs to categories of nonpoint sources. A Technical Report provides descriptions of the detailed technical approaches used throughout the TMDL development process. West Virginia developed an interactive ArcExplorer geographic information system (GIS) project that shows the spatial relationships between source assessment data for selected streams in the Gauley River Watershed.

III. Background

The Gauley River Watershed is located in southern West Virginia and lies mostly within Webster, Pocahontas, Greenbrier, and Nicholas Counties with some portions of the watershed in Randolph, Clay, Fayette, and Summers Counties. The Gauley River Watershed, a component of the New/Kanawha River Watershed, encompasses nearly 1,419 square miles. The Gauley River mainstem runs through the northern portion of the watershed. Major tributaries include Twentymile Creek, Williams River, Cranberry River, Cherry River, and Meadow River. The Gauley River Watershed is dominated by forest land uses (85.7%), with some grassland (7.0%), mining (2.4%), abandoned mine lands (AML) (1.5%), urban/residential (1.3%) and water (1.0%) (Table 3-1). All other land uses compose less than two percent of the total watershed area.

West Virginia conducted extensive water quality monitoring from July 2003 through June 2004 in the Gauley River Watershed. The results of this effort were used to confirm the listing of waterbodies not meeting applicable water quality criteria and to identify impaired waterbodies that were not previously listed. TMDLs were developed for the impaired waterbodies in 15 subwatersheds (Figure 3-2): Big Beaver Creek, Big Run, Cherry Run, Cranberry River, Hominy Creek, Little Laurel Creek, Meadow River, Muddlety Creek, Panther Creek, Peters Creek, Rich Creek, Scrabble Creek, Turkey Creek, Twentymile Creek, and

Williams River. Table 3-3 (of the TMDL Report) presents the 106 impaired waters for which TMDLs are developed. The TMDLs were developed for some combination of total iron, dissolved aluminum, pH, selenium, fecal coliform bacteria and/or biological impairment including 139 TMDLs (waterbody/pollutant combinations). The 15 subwatersheds were further divided into 447 subwatersheds for modeling purposes (Figure 8-1). The subwatershed delineation provided a basis for georeferencing pertinent source information and monitoring data, and for presenting TMDLs.

These TMDLs were developed by West Virginia and approved by EPA consistent with the requirements of the 1997 TMDL lawsuit Consent Decree and Settlement Agreement for the case OVEC Inc., et al., v. Browner, et al. The 1997 Consent Decree requires that West Virginia, or EPA if West Virginia fails to, develop TMDLs for acid mine drainage (AMD) impaired waters (including tributaries in the Gauley River Watershed) which were scheduled for completion by March 30, 2008. There is also an interim deadline of 350 mine drainage TMDLs by March 30, 2006, which has been met. The establishment of the Gauley River Watershed TMDLs helps to meet the March 30, 2008, deadline for completion of all mine drainage TMDLs. These TMDLs also included several non-consent decree waters listed on the 2002, 2004, and 2006 Section 303(d) Lists that help West Virginia to meet TMDL development pace requirements.

WVDEP recently assumed responsibility for the TMDL Program and utilized the Watershed Management Framework cycle approach for TMDL development. The framework divides the state into 32 major watersheds and operates on a five-year, five-step process. The watersheds are divided into five hydrologic groups (A - E). Each group is assessed once every five years and waters are placed on the Section 303(d) List of impaired waters, as necessary. The TMDL process begins in the first year of the cycle with pre-TMDL sampling and public meetings in the affected watersheds. The data is compiled and TMDL development begins in year two of the cycle. In the third year, TMDL development continues and the TMDL is drafted. The TMDL is finalized in the fourth year. In the fifth year of the cycle, TMDL implementation is initiated through the National Pollutant Discharge Elimination System (NPDES) permitting process and efforts toward limiting nonpoint source loading. Throughout the TMDL development process, there are numerous opportunities for public participation and input. The Gauley River Watershed is in hydrologic group C, and is one of the first TMDLs developed by WVDEP. West Virginia's TMDL process is described in Section 2.1 of the TMDL report.

Computational Procedures

Sections 4, 5 and 6 of the TMDL Report discuss metals, pH, fecal coliform bacteria and sediment source assessment while Section 7 describes biological impairments and stressor identification (SI) methods. Sources for metals in the Gauley River Watershed are: point sources, including mining, non-mining, and construction stormwater permits; and unpermitted sources of mine drainage from abandoned mine lands (AMLs) and bond forfeiture sites; as well as sediment sources including forestry, oil and gas, roads, agriculture, streambank erosion, and other land disturbance activities. The primary selenium sources were assumed to be the point

sources associated with mining activity that disturbs subsurface strata containing high selenium concentrations. Nonpoint sources associated with surface disturbances (i.e. barren areas, unpaved roads, harvested forest, and oil and gas well operations) were considered to be negligible sources of selenium because these land disturbances typically do not disturb subsurface strata containing selenium. The pH impairments in the Gauley Watershed have been attributed to historic mining or acid deposition and low watershed buffering capacity. Fecal coliform bacteria sources are point sources, including individual sources covered under the NPDES program such as wastewater treatment plants and general sewage permits; and unpermitted sources, including on-site treatment systems, stormwater runoff, agriculture, and natural background (wildlife). There are no combined sewer overflows (CSOs), sanitary sewer overflows (SSOs), or municipal separate storm sewer systems (MS4s) identified in the impaired watersheds. SI indicated that biological impairments were caused by metals toxicity, pH toxicity, sedimentation, organic enrichment, or ionic toxicity. The Technical Report has expanded details of the source assessment and biological SI.

Biological integrity/impairment is based on a rating of the stream's benthic macroinvertebrate community using the multimetric West Virginia Stream Condition Index (WVSCI). Biological impairments were addressed by developing TMDLs for specific stressors. West Virginia utilized a SI process to determine the primary causes of biologically impaired streams including metals toxicity, pH toxicity, sedimentation, organic enrichment or ionic toxicity. SI was followed by stream-specific determinations of the pollutants for which TMDLs must be developed. The SI process identified metals toxicity and pH toxicity as biological stressors in waters that also demonstrated violations of the iron, aluminum, or pH water quality criteria for protection of aquatic life. All streams identified with sedimentation as the biological stressor were also impaired pursuant to the iron water quality criteria and TMDL assessment for iron included representation and allocation of iron loadings associated with sediment. WVDEP initially pursued the development of sediment TMDLs for these streams using a reference watershed approach. In each stream, the sediment loading reduction necessary for attainment of the water quality criteria for iron exceeds that which was determined necessary using the reference watershed approach for sediment. Therefore, the iron TMDLs are acceptable surrogates for biological impairments from sedimentation. Where organic enrichment was identified as the biological stressor, the waters also demonstrated violations of the numeric fecal coliform bacteria criteria. It was determined that implementation of the fecal coliform TMDLs would require the elimination of the majority of the existing fecal coliform sources and thereby reduce the organic and nutrient loading causing biological impairment. Implementation of these pollutant-specific TMDLs will address the biological impairments. In certain waters, the SI process determined ionic toxicity as the primary stressor. However, information available regarding the causative pollutants and their associated impairment thresholds was insufficient for TMDL development at this time. Therefore, WVDEP deferred TMDL development for those waters with ionic toxicity as a causative stressor and retained them on the Section 303(d) List.

Section 8 describes the modeling processes employed during TMDL development with further details described in the Technical Report. A variety of modeling tools were used to develop the metals, pH and fecal coliform TMDLs, including the Mining Data System (MDAS),

Dynamic Equilibrium In-Stream Chemical Reactions model (DESC-R), and a customized spreadsheet to determine the fecal loading from failing septic systems identified during source tracking efforts by WVDEP.

MDAS was used to represent the source-response linkage in the Gauley River Watershed TMDL study area for total iron, dissolved aluminum, fecal coliform, and net acidity. MDAS is a comprehensive data management and modeling system that is capable of representing loads from nonpoint and point sources in the watershed and simulating instream processes. MDAS is used to simulate watershed hydrology and pollution transport, as well as stream hydraulics and instream water quality. It is capable of simulating different flow regimes and pollutant loading variations. Metals are modeled in MDAS in total recoverable form. Therefore, it was necessary to link MDAS with DESC-R to appropriately address dissolved aluminum TMDLs in the Gauley River Watershed. TMDLs for pH impairments were developed using a surrogate approach in which it was assumed that reducing instream metals (iron and aluminum) concentrations to meet water quality criteria (or TMDL endpoints) would result in meeting the water quality standard for pH. This assumption was verified by applying the DESC-R model. Net acidity TMDLs were developed for streams impaired by pH due to acidic atmospheric deposition. A customized Microsoft Excel spreadsheet tool was used to determine the fecal loading from failing septic systems identified during source tracking efforts by WVDEP. West Virginia's numeric and water quality criteria and an explicit MOS were used to identify the TMDL endpoints.

The selenium TMDL approach for Hughes Fork included calculating the assimilative capacity for selenium available at the mouth of Hughes Fork at 7Q10 flow. The primary sources contributing to selenium impairments were assumed to be point sources associated with mining activity. Nonpoint sources in the watershed did not appear to be contributing excessive loads of selenium to the watershed and, therefore, are not required to reduce loadings. The WLAs for all mining point sources were determined by assigning water quality criteria at the end-of-pipe (5.0 µg/L). This TMDL approach is consistent with the applicable water quality based effluent limitation development protocol for the instream treatment structures that are present within the watershed. Criteria end-of-pipe allocations are also protective at higher flow conditions.

EPA has determined that these TMDLs are consistent with statutory and regulatory requirements and EPA's 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 applicable numeric water quality criteria are shown in Table 2-1 of the TMDL Report. The applicable designated uses for all the waters subject to this report are propagation and maintenance of aquatic life in warmwater fisheries and troutwaters, water contact recreation, and public water supply. Most of the waters in the Gauley River Watershed are designated as warmwater fisheries, but there are 17 impaired streams designated as troutwaters (Table 3-3, of the TMDL Report). For the pollutants causing the impaired waters of this report, West Virginia numeric water quality criteria for warmwater fisheries and troutwaters vary with respect to iron

and aluminum. In various streams in the Gauley River Watershed, the aquatic life use has been determined to be violated pursuant to exceedances of iron, dissolved aluminum, selenium, and/or pH numeric water quality criteria. Water contact recreation and public water supply use impairments have also been determined pursuant to exceedances of numeric water quality criteria for fecal coliform bacteria.

All West Virginia waters are subject to the narrative criteria in Section 3 of the Standards. That section, titled *Conditions Not Allowed in State Waters*, contains various provisions relative to water quality. The narrative water quality criterion at 46 CSR 1 - 3.2.i prohibits the presence of wastes in state waters that cause or contribute to significant adverse impacts on the chemical, physical, hydrologic, and biological components of aquatic ecosystems. This provision is the basis for the “biological impairment” determinations. Biological impairment signifies a stressed aquatic community. WVDEP determines each stream’s biological integrity based on a rating of the stream’s benthic macroinvertebrate community using the multimetric WVSCI.

2. *The TMDLs include a total allowable load as well as individual wasteload 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 WLAs for point sources, LAs for non-point sources, and natural background levels. In addition, the TMDL must include an 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:

$$\text{TMDL} = \text{Summation of WLAs} + \text{Summation of LAs} + \text{MOS}$$

For purposes of these TMDLs only, WLAs are given to NPDES permitted discharge points and load allocations are given to discharges from activities that do not have an associated NPDES permit, such as mine forfeiture sites, AMLs (including tunnel discharges, seeps, and surface runoff), failing septic systems, and straight pipes. The decision to assign load allocations to these sources does not reflect any determination by WVDEP or EPA as to whether there are, in fact, unpermitted point source discharges. In addition, by establishing these TMDLs with mine drainage discharges, failing septic systems and straight pipes treated as load allocations, WVDEP and EPA are not determining that these discharges are exempt from NPDES permitting requirements.

Each subwatershed appendix presents applicable TMDLs for aluminum, iron, selenium, net acidity, and/or fecal coliform bacteria, as appropriate. Allocation spreadsheets also provide applicable TMDLs, WLAs to individual point sources and LAs to categories of unpermitted sources. The Metals and pH Allocation Spreadsheet presents the detailed metal TMDLs, LAs, WLAs, and pH results. The Acid Deposition pH Allocation Spreadsheet presents net acidity

TMDLs as a gross LA because the source of impairment is limited to atmospheric deposition. The Fecal Coliform Bacteria Allocation Spreadsheet presents detailed fecal coliform TMDLs, LAs, and WLAs. With the exception of selenium, TMDLs are presented as average annual loads because they were developed to meet TMDL endpoints under a range of conditions observed throughout the year. The TMDLs are also presented as equivalent daily average loads. Selenium TMDLs are presented as an equation for the maximum daily load that is variable with receiving stream flow.

Sources for metals and pH in the Gauley River Watershed are: point sources, including mining, non-mining, and construction stormwater permits; and unpermitted sources of mine drainage from AMLs and bond forfeiture sites; as well as sediment sources including forestry, oil and gas, roads, agriculture, streambank erosion, and other land disturbance activities. There are a total of 61 mining related NPDES permits with 499 associated outlets within the TMDL study area. The TMDLs required some mining permits to be reduced for iron and aluminum. There are eight non-mining NPDES permitted facilities with 16 associated outlets in the watershed that have effluent limits for metals and pH. There are also three construction stormwater permits. The TMDL does not prescribe pollutant reduction from the existing non-mining point sources or construction stormwater sources. A complete list of the permits and outlets is provided in the appendices of the Technical Report. Non-mining NPDES permitted outlets in the watershed may include the wastewater discharges from water treatment plants. In addition, the discharges from construction activities that disturb more than 1 acre of land are legally defined as point sources. The sediment introduced from such discharges can contribute metals. All other non-mining NPDES permits (i.e., the wastewater discharges) must discharge at a pH between 6.0 and 9.0. Based on the minimal flows of their discharges, these permitted non-mining sources are believed to be negligible. Under these TMDLs, these minor discharges are assumed to operate under their current permit limits and were given WLAs based on their current permit limits. WVDEP issued a general NPDES permit to regulate stormwater flowing into streams from discharges associated with construction activities. LAs for metals were assigned to AMLs, bond forfeiture sites, and sediment sources including forestry, oil and gas, roads, agriculture, and other land disturbance areas.

The TMDL Report submitted on September 13, 2007, contained iron TMDLs for eight troutwaters in which the pollutant reductions associated with the prescribed LAs and WLAs do not assure complete attainment of the troutwater, chronic aquatic life protection criterion. The affected troutwaters are Brushy Fork (WVKG-26-K), Peters Creek (WVKG-13, above Buck Garden Creek), Panther Creek (WVKG-32), Little Clear Creek (WVKG-19-V), Laurel Creek (WVKG-19-V-5), Kuhn Branch (WVKG-19-V-7), Hominy Creek (WVKG-24, upstream of RM 17.3), and Brushy Meadow Creek (WVKG-24-E-2). Non-attainment is predicted when large precipitation events elevate instream total suspended sediments (TSS) concentrations and has been attributed to the relatively high iron content of the soils in these watersheds. The magnitudes of the predicted exceedances under TMDL conditions are not extreme, but exceedances are predicted more often than the once per three years average frequency prescribed by the criterion.

A letter submitted to EPA on January 15, 2008, provided further clarification of WVDEP's plans to address predicted nonattainment in the eight troutwaters and calculations of TMDLs necessary for attainment of the currently effective criteria. The allocations associated with all of the troutwater iron TMDLs reflect pollutant reductions for existing sources to the maximum practical extent. WLAs for permitted point sources and LAs for continuous discharge AML sources and bond forfeiture sites are set at the value of the troutwater criterion. LAs for precipitation-induced upland nonpoint sources are commensurate with background loadings from undisturbed forest and LAs for bank erosion are set equal to loadings associated with the best available bank conditions measured in the watershed. Even with these stringent reductions, the model indicates that the iron TMDLs for the eight troutwaters do not result in complete attainment of the currently effective troutwater iron criteria. Predicted criterion exceedances at the TMDL condition appear to be attributable to natural conditions (high iron content in soils) and, given the presence and apparent viability of trout, may indicate that the existing troutwater iron criterion may be overly conservative in relation to the protection of the troutwater designated uses in these waters. WVDEP plans an adaptive implementation approach under which the prescribed troutwater iron TMDLs contained in the TMDL Report submitted on September 13, 2007, will be implemented as an interim goal concurrently with reassessment of the troutwater iron criterion for these streams. In order to determine possible alternative criterion, development of a monitoring plan has been initiated which will include a special monitoring effort for minimally impacted and documented viable troutwaters in the watershed. Field work will be completed in calendar year 2008. Based upon the new data, WVDEP will determine whether an alternative criterion or other modifications of the water quality standards or TMDLs appear warranted. The January 15, 2008, letter included additional tables displaying calculations of the troutwater iron TMDLs that will result in attainment of the currently effective troutwater iron criterion.

The primary selenium sources were assumed to be the point sources associated with mining activity that disturbs subsurface strata containing high selenium concentrations. Nonpoint sources associated with surface disturbances (i.e. barren areas, unpaved roads, harvested forest, and oil and gas well operations) were considered to be negligible sources of selenium because these land disturbances typically do not disturb subsurface strata containing selenium. There is one mining related NPDES permit with four associated outlets in the one watershed impaired for selenium. WLAs were determined by assigning water quality criteria at the end-of-pipe (5.0 µg/L) to all surface mining operations discharging in the selenium impaired watersheds.

The pH impairments in the Gauley Watershed have been attributed to historic mining or acid deposition and low watershed buffering capacity. Net acidity TMDLs were developed in 29 streams impaired by pH due to acidic atmospheric deposition. Because the source of impairment is limited to atmospheric deposition, these TMDLs incorporate only a gross LA. The TMDLs represent the annual net acidity loads that can be present at the downstream extent of impaired streams while maintaining the pH TMDL endpoint.

Fecal coliform bacteria sources are point sources, including individual sources covered under the NPDES program such as wastewater treatment plants and general sewage permits; and unpermitted sources, including onsite treatment systems, stormwater runoff, agriculture, and natural background (wildlife). There are no CSOs, SSOs, or MS4s identified in the impaired watersheds. Fecal coliform bacteria TMDLs were developed in 30 streams and will affect six permits including three privately owned sewage treatment plants (“package plants”), two home aeration units (HAUs), and one publicly owned treatment works (POTW). The TMDLs allowed fecal coliform NPDES permits to remain at 200 counts/100 ml (monthly average) and 400 counts/100 ml (daily maximum). Load allocations were assigned to pasture, onsite sewer systems including failing septic systems and straight pipes, residential landuses including urban/residential runoff, and background and other nonpoint sources including wildlife sources from forested land and grasslands in non-MS4 areas. Fecal coliform reductions will require elimination of illicit discharges, straight pipes, and leaking septic systems, which would substantially reduce organic and nutrient loadings. The loadings from wildlife sources were not reduced.

The TMDL development methodologies prescribe allocations that achieve water quality criteria throughout the watershed. Various provisions attempt equity between categories of sources and the targeting of pollutant reductions from the most problematic sources. Nonpoint source reductions did not result in loading contributions less than the natural conditions, and point source allocations were not more stringent than numeric water quality criteria.

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

The TMDL considers the impact of background pollutant contributions by considering loadings from background sources like wildlife. MDAS also considers background pollutant contributions by modeling all land uses.

4. The TMDLs consider critical environmental conditions.

According to EPA’s regulation 40 CFR §130.7 (c)(1), TMDLs are required to take into account critical conditions for stream flow, loading, and water quality parameters. The intent of this requirement is to ensure that the water quality of the impaired waterbody is protected during times when it is most vulnerable.

Critical conditions are important because they describe the factors that combine to cause a violation of water quality standards and will help in identifying the actions that may have to be undertaken to meet water quality standards. Critical conditions for waters impacted by land based nonpoint sources generally occur during periods of wet weather and high surface runoff. In contrast, critical conditions for point source dominated systems generally occur during low flow and low dilution conditions. Point sources, in this context also include nonpoint sources that are not precipitation driven (i.e., fecal deposition to stream). Analysis of water quality data for the Gauley River Watershed shows high pollutant concentrations during both high and low flow, indicating that there are both point and nonpoint source impacts. Both high flow and low

flow periods were taken into account during TMDL development by using a long period of weather data that represented wet, dry, and average flow periods.

5. The TMDLs consider seasonal environmental variations.

Seasonal variations were considered while considering critical conditions, by running the daily simulation model for several years, from 1987 to 1992 for MDAS. Continuous simulation (modeling over a period of several years that capture precipitation extremes) inherently considers seasonal hydrologic and source loading variability.

6. The TMDLs include a Margin of Safety.

The CWA and Federal regulations require TMDLs to include an MOS to take into account any lack of knowledge concerning the relationship between effluent limitations and water quality. EPA 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 explicit MOS of five percent was included to counter uncertainty in the modeling process (Section 8.5.1). West Virginia also set the modeling endpoints to 95 percent of the water quality standards as an additional MOS, Section 8.5.1. West Virginia did not include a discussion regarding an implicit MOS but did use conservative model assumptions (such as assuming all point sources continually discharge at permit limits) to develop the allocations.

An implicit MOS was included in the Hughes Fork selenium TMDL where WLAs were prescribed for the surface mining point sources at water quality at the end-of-pipe. Under these conditions, there will be no excessive contribution of selenium at the low flow 7Q10 conditions where the assimilative capacity is lowest. Determination of an explicit MOS is not necessary for this TMDL because compliance with the WLAs will assure attainment of the water quality standards.

For pH impairments associated with atmospheric deposition, TMDLs are presented as the annual net acidity load associated with maintenance of the pH TMDL endpoint of 6.02.

7. The TMDL has been subject to public participation.

Section 10 describes the public participation which included two meetings to present information on fundamental TMDL concepts and to present West Virginia's proposed TMDL allocation strategies, a 30-day public comment period, and a final public informational meeting. The 30-day public comment period was held from June 1, 2007 to July 2, 2007, with a public meeting held on June 14, 2007, in Summersville, West Virginia. West Virginia only received comments from EPA which were appropriately addressed.

IV. Discussion of Reasonable Assurance

EPA requires that there be a reasonable assurance that a TMDL can be implemented. Section 11 addresses reasonable assurance. There are six primary programs in effect which provide reasonable assurance that the TMDLs will be implemented. Section 11.1 discusses permit reissuance by WVDEP's Division of Water and Waste Management scheduled to begin in July 2007 for non-mining facilities and in January 2008 for mining facilities. Section 11.2 discusses the Watershed Management Framework Process. Section 11.3 discusses ongoing public sewer projects. Sections 11.4 and 11.5 discuss Abandoned Mine Land (AML) and special reclamation projects, respectively, that are conducted by West Virginia Division of Land Restoration (WVDLR). Section 11.6 discusses West Virginia's Division of National Resources (WVDNR)'s limestone treatment of streams impaired by low pH due to atmospheric deposition.

Section 12 discusses monitoring activities including NPDES compliance, nonpoint source project monitoring, and TMDL effectiveness monitoring.

Section 9 discusses the future growth and water quality trading in the Gauley River Watershed TMDL. For metals and pH, a new facility could be permitted in the watershed, provided that effluent limitations are based upon the achievement of water quality standards end-of-pipe for the pollutants of concern in the TMDL. Remining (under an NPDES permit) could occur in AMLs without a specific allocation to the new permittee provided that the requirements of existing state remining regulations are met. Remining activities, if conducted pursuant to Section 301(p) of the CWA, will not worsen water quality criteria and, in some instances, may result in improved water quality in abandoned mining areas. Subwatershed-specific future growth allowances have been provided for site registrations under the Construction Stormwater General Permit. In general, construction stormwater permits are allowed specific future growth including 0.5 percent of the modeled subwatershed area to be registered under the general permit at any point in time. In many cases, the implementation of the fecal coliform bacteria TMDLs will consist of providing public sewer service to unsewered areas. A new facility could be permitted in the watershed, provided that the permit includes average monthly and maximum daily fecal coliform limitations of 200 counts/100 ml and 400 counts/100 ml, respectively, which are the technology-based fecal coliform effluent limitations that are more stringent than applicable water quality criteria.

There are no watershed associations specifically for the Gauley River Watershed. However, there are several local watershed associations including the Plateau Action Network, Indian Creek Watershed Association, and Webster County Watershed Association.