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

Mr. Scott Mandirola, Director
Division of Water and Waste Management
West Virginia Department of Environmental Protection
601 57th Street SE
Charleston, West Virginia 25304-2345

JUL 29 2014

Dear Mr. Mandirola:

The United States Environmental Protection Agency (EPA), Region III, is pleased to approve the Total Maximum Daily Loads (TMDLs) developed for metals (total iron and dissolved aluminum), pH, chloride, and fecal coliform the West Fork River watershed. The TMDLs were established to address impairments of water quality, as identified on West Virginia's 2012 Section 303(d) List. The West Virginia Department of Environmental Protection submitted the report, *Total Maximum Daily Loads for the West Fork River Watershed, West Virginia*, to EPA for review and approval on June 26, 2014. The TMDLs were established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act.

In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain applicable water quality standards; (2) include a total allowable loading, and as appropriate, 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); and (7) be subject to public participation. The TMDLs for the selected streams of the West Fork River watershed satisfy each of these requirements. In addition, the TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. A rationale of our approval is enclosed.

As you know, any new or revised National Pollutant Discharge Elimination System permits must be consistent with the assumptions and requirements of applicable TMDL wasteload allocations pursuant to 40 CFR §122.44(d)(1)(vii)(B). Please submit all such permits to EPA for review per EPA's letters dated October 1, 1998, and July 7, 2009.

If you have any questions regarding these TMDLs, please contact Ms. Helene Drago, TMDL Program Manager, at 215-814-5796.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

cc: Mr. John Wirts (WVDEP)
Mr. David Montali (WVDEP)

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Decision Rationale
Total Maximum Daily Loads for
West Fork River Watershed,
West Virginia

Jon M. Capacasa, Director
Water Protection Division

Date: 7/29/2014

Decision Rationale
Total Maximum Daily Loads for the
West Fork River Watershed, West Virginia

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by a state where technology-based and other controls do not provide for the 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's) rationale for approving the TMDLs for metals (dissolved aluminum and total iron), pH, chloride, and fecal coliform bacteria in selected streams of the West Fork River watershed. The TMDLs were developed to address impairments of water quality as identified in West Virginia's 2012 Section 303(d) list of impaired waters. The West Virginia Department of Environmental Protection (WVDEP) submitted the report, *Total Maximum Daily Loads for the West Fork River Watershed, West Virginia*, to EPA on June 26, 2014. EPA's rationale is based on the determination that the TMDLs meet the following seven 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 wasteload allocations (WLAs) and load allocations (LAs).
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) The TMDLs have 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 rationale can be found in West Virginia's TMDL Report, *Total Maximum Daily Loads for the West Fork Watershed, West Virginia*, unless otherwise noted.

II. Summary

Table 3-3 of the final TMDL document presents the waterbodies and impairments for which TMDLs have been developed in the West Fork River watershed. West Virginia identified 305 streams in the West Fork River watershed as impaired due to exceedances of some

combination of the numeric water quality criteria for fecal coliform bacteria, metals (total iron and dissolved aluminum), pH, and chloride. In addition, certain waters in the West Fork River watershed were listed as biologically impaired based on the narrative water quality criteria of 47 CSR §2-3.2.i, which 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. Attachment 1 of this Decision Rationale presents the impaired waterbodies of the West Fork River watershed.

A stressor identification process was used to determine the pollutants for which TMDLs must be developed in the West Fork River watershed. Stressor identification entails reviewing available information, forming and analyzing possible stressor scenarios and implicating causative stressors. The primary data set used for the stressor identification was generated through pre-TMDL monitoring (Technical Report, Appendix K). In the West Fork River watershed, the stressor identification confirmed the presence of iron, dissolved aluminum, chloride, fecal coliform bacteria, and pH within the watershed. The stressor identification also identified organic enrichment, ionic toxicity, and sedimentation as sources of impairment in the West Fork River watershed. TMDLs were established for the pollutants that would reduce the sources of impairment within the watershed.

Section 10 presents the TMDLs developed for the West Fork River watershed on a daily load basis. The TMDLs are also represented in Microsoft Excel spreadsheets (submitted by West Virginia via compact disc) which provide detailed source allocations and successful TMDL scenarios. These TMDLs were presented as average annual loads because they were developed to meet TMDL endpoints under a range of conditions observed throughout the year. The loads are expressed in pounds per year, or counts per year, which may be divided by 365 days per year to express the TMDLs in pounds per day or counts per day. A technical report was included by West Virginia to describe the detailed technical approaches that were used during TMDL development and to display the data upon which the TMDLs were based. West Virginia also provided an ArcView Geographic Information System (GIS) project (and shapefiles) that explores the spatial relationships among the pollutant sources in the watershed.

III. Background

The West Fork River watershed is located in north-central West Virginia (Figure 3-1) and encompasses 881 square miles. Of the 881 total square miles in the watershed, only 825 square miles were modeled under this TMDL effort. There are two major lakes in the watershed, Stonecoal Lake and Stonewall Jackson Lake that are not considered to be impaired and were not included in the TMDL effort. The West Fork River begins near the community of Rock Cave and extends north towards Fairmount, and lies in portions of Marion, Harrison, Lewis, Barbour, Taylor and Upshur Counties. Major tributaries within the watershed are Stonecoal Creek, Hackers Creek Simpson Creek, and Tenmile Creek. The dominant land use in the West Fork River watershed is forest, which constitutes 71.3 percent of the total land use area. Other important modeled land use types are, grassland (9.71%), agriculture (6.19%), and urban/residential (5.66%) as shown in Table 3-1. The total population living in the watershed is estimated to be 90,000 people.

West Virginia utilized a stressor identification process to determine the primary causes of impairment in the West Fork River watershed. Stressor identification was followed by stream-specific determinations of the pollutants for which TMDLs must be developed. Metals, pH, chloride, and fecal coliform bacteria stressors were identified in waters that had violations of total iron, dissolved aluminum, pH, chloride or the fecal coliform bacteria numeric water quality criteria. When the stressor identification process identified that a specific pollutant was a causative stressor, TMDLs were developed for that pollutant. For the organic enrichment impairment identified in the watershed, it was determined that the implementation of fecal coliform TMDLs would require the elimination of the majority of existing fecal coliform sources and thereby resolve organic enrichment stress. Therefore, fecal coliform TMDLs will serve as a surrogate where organic enrichment was identified as a stressor. For the sediment impairment identified in the watershed, it was determined that the sediment reductions necessary to ensure the attainment of iron water-quality criteria exceed those that would be needed to address the biological impairment in the West Fork River watershed. As such, iron TMDLs are acceptable surrogates for the sediment impairment in the watershed.

Sections 5, 6, 7, and 8 discuss the metals, pH, chloride, and fecal coliform bacteria in the West Fork River watershed. The sources of metals and sediment in the watershed include: mining permits, bond forfeiture sites, municipal separate storm sewers (MS4s), non-mining permits for construction stormwater and unpermitted sources of mine drainage from abandoned mine lands (AMLs); as well as sediment sources including forestry, oil and gas, roads, agriculture, streambank erosion, and other land disturbance activities. The pH impairments in the watershed have been attributed to discharges from AML. The sources of chloride include: mining permits and nonpoint source urban/residential impervious land runoff. The fecal coliform bacteria sources in the watershed include: wastewater treatment plants, combined sewer overflows (CSOs), MS4s, general sewage permits, unpermitted sources, including on-site treatment systems, stormwater runoff, agriculture, and natural background (wildlife). The technical report has expanded details of the source assessment in the West Fork River watershed.

Computational Procedures

The Mining Data Analysis System (MDAS) was used to represent the source-response linkage in the West Fork River watershed TMDL for dissolved aluminum, total iron, pH, chloride, and fecal coliform bacteria. MDAS was developed to facilitate large scale, data intensive watershed modeling applications. The model is used to simulate watershed hydrology and pollutant transport as well as stream hydraulics and instream water quality. MDAS is capable of simulating different flow regimes and pollutant variations. A key advantage of the MDAS development framework is that it has no inherent limitations in terms of modeling size or upper limit model operations. In addition, the MDAS model allows for seamless integration with modern-day, widely available software such as Microsoft Access and Excel.

Configuration of the MDAS model involved subdividing the TMDL watershed into subwatershed modeling units connected by stream reaches (Figure 3-2). The TMDL watershed

was divided to allow for the evaluation of water quality and flow at pre-TMDL monitoring stations. The subdivision process also ensures a proper stream network configuration within the basin. The physical characteristics of the subwatersheds, weather data, land use information, continuous discharges, and stream data were used as input for the MDAS model. Flow and water quality were continuously simulated into the model on an hourly time-step. Model setup consisted of configuring the MDAS model four times to simulate loading conditions for the following pollutant groups in the West Fork River watershed: iron/sediment, aluminum/pH, chloride, and fecal coliform bacteria.

The calibrated model provides the basis for performing the allocation analysis. The first step is to simulate baseline conditions, which represent existing nonpoint source loadings and point source loadings at permit limits. Baseline conditions allow for an evaluation of instream water quality under the highest expected loading conditions. The MDAS model was run for baseline conditions using hourly precipitation data for a representative six year simulation period (January 1, 2004 through December 31, 2009). The precipitation experienced over this period was applied to the land uses and pollutant sources as they existed at the time of TMDL development. Predicted instream concentrations were compared directly with the TMDL endpoints. This comparison allowed for the evaluation of the magnitude and frequency of exceedances under a range of hydrologic and environmental conditions.

The MDAS model provided allocations for metals (iron and dissolved aluminum), pH, chloride, and fecal coliform bacteria in the 305 impaired streams of the West Fork River watershed. The TMDLs are shown in Section 10 and are presented as average daily loads, in pounds per day, or counts per day. 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 for iron, dissolved aluminum, pH and fecal coliform bacteria are shown in Table 2-1 of the final TMDL document. The applicable designated uses in the watershed include: propagation and maintenance of aquatic life in warm water fisheries and troutwaters, water contact recreation, and public water supply. In various streams of the West Fork River watershed, warmwater fishery aquatic life use impairments have been determined pursuant to exceedances of iron, dissolved aluminum, chloride and/or pH numeric water quality criteria. Water contact recreation and/or public water supply use impairments have also been determined in various waters pursuant to exceedances of numeric water quality criteria for fecal coliform bacteria, pH, chloride, and total iron.

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 TMDLs presented in Section 10 are based upon the water quality criteria that are currently effective. If the West Virginia Legislature adopts Water Quality Standard revisions that alter the basis upon which the TMDLs are developed, then the TMDLs and allocations may be modified as warranted. Any future Water Quality Standard revision and/or

TMDL modification must receive EPA approval prior to implementation.

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 receiving waters 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, TMDLs 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.

Total Iron TMDLs

WLAs were developed for all point sources permitted to discharge iron under a NPDES permit. Because of the established relationship between iron and Total Suspended Solids (TSS) in the watershed, iron WLAs were provided for facilities with stormwater discharges, MS4 facilities, and facilities registered under the General NPDES permit for construction stormwater. WLAs were also developed for all existing outlets of NPDES permits for mining activities, except for those where reclamation has progressed to the point where existing limitations are based upon the *Post-Mining Area provisions of Subpart E of 40 CFR §434*. There are 39 mining related NPDES permits with 220 associated outlets in the metals impaired waters of the West Fork River watershed. WVDEP and the Division of Water and Waste Management (DWWM) personnel used information contained in the Surface Mining Control and Reclamation Act (SMCRA), Article 3, and NPDES permits to characterize the mining point sources. Information gathered included type of discharge, pump capacities, and drainage areas (including total and disturbed areas). Using this information, the mining point sources were represented in MDAS and assigned individual WLAs.

The discharges from construction activities that disturb more than one acre of land are legally defined as point sources and the sediment introduced from such sources can contribute iron loadings. WVDEP issues a General NPDES Permit (WV0115924) to regulate stormwater discharges associated with construction activities with a land disturbance greater than one acre. Subwatershed-specific future growth allowances have been provided for site registrations under the Construction Stormwater General Permit. The TMDL allocation provides 0.5 to 2.5 percent of the modeled subwatershed area to be registered under the general permit at any point in time.

There are 246 modeled non-mining NPDES permitted outlets in the West Fork River watershed (four water treatment plant discharges, one individual industrial wastewater discharge, 80 individual industrial stormwater discharges, 144 storm water industrial general permit discharges, and 10 solid waste landfill discharges, and seven POTW stormwater discharges). Baseline iron conditions for bond forfeiture sites were established at the technology based effluent limits of 40 CFR 434 and reduced as needed to attain the TMDL endpoints. The WLAs for all non-mining NPDES outlets allow for continued discharge under existing permit

requirements. A complete list of the permits and outlets in the West Fork River watershed is provided in Appendix F of the Technical Report.

Total iron LAs were allocated to the predominant nonpoint sources of iron in the watershed, including: sediment contributions from barren lands, harvested forest, oil and gas operations, agricultural land uses, urban land uses and streambank erosion. Streambank erosion has been determined to be a significant sediment source in the watershed. The sediment loading from bank erosion loadings are most strongly influenced by upland impervious area and bank stability. The streambank erosion modeling process is discussed in Section 9.2.2. The oil and gas data incorporated into the TMDL model were obtained from the WVDEP GIS coverage. There are 5906 conventional active oil and gas wells (comprising 8150.3 acres), 67 vertical Marcellus wells (229.1 acres), and 311 horizontal Marcellus wells (765.9 acres) represented in the metals impaired TMDL watersheds addressed in this report. Runoff from unpaved access roads to these wells and disturbed areas around the wells contribute sediment to adjacent streams (Figure 5-5).

The Office of Abandoned Mine Lands and Reclamation (AML&R) identified locations of AML in the West Fork River watershed. In addition, source tracking efforts were conducted by WVDEP and DWWM to identify AML sources in the watershed (discharges, seeps, portals, and refuse piles). Field data, such as GPS locations, water samples, and flow measurements were collected to represent AML sources and characterize their impact on water quality. In the TMDL watershed, a total of 379.2 miles (3016 acres) of AML highwall and 131 AML seeps were incorporated into the TMDL model (Figure 5-4).

Dissolved Aluminum and pH TMDLs

Source allocations were developed for the dissolved aluminum and pH impaired streams of the West Fork River watershed. Substantive sources of total iron were reduced prior to total aluminum reduction because existing instream dissolved iron concentrations can significantly reduce pH and consequentially increase dissolved aluminum concentrations. In the six subwatersheds impaired for dissolved aluminum and pH, the dissolved aluminum and pH TMDL endpoints were not attained after source reductions to iron. Therefore, the total aluminum loading was reduced in combination with acidity reduction (via alkalinity addition) to the extent necessary to attain water quality criteria for both pH and dissolved aluminum. WLAs were developed for active mining point source discharges regulated by NPDES permits, including: active mining operations, Multi-sector stormwater, MS4, and Construction Stormwater General Permits. LAs were assigned to: AMLs, barren land, harvested forest, oil and gas well operations, agriculture, undisturbed forest and grasslands, and residential/urban/road land uses.

Fecal Coliform Bacteria TMDLs

WLAs were developed for all facilities permitted to discharge fecal coliform bacteria, including: sewage treatment plants, MS4s and CSOs. In the West Fork River watershed, there are twelve publicly owned treatment works (POTW) that discharge treated effluent at thirteen outlets. Those permits include 7 stormwater outlets with fecal coliform limits. Four mining

bathhouse facilities discharge to TMDL streams in the West Fork River TMDL watersheds. There are two outlets regulating sewage at individually permitted industrial facilities. These sources are regulated by NPDES permits that require effluent disinfection and compliance with strict fecal coliform effluent limitations (200 counts/100 ml).

The MS4s in the watershed are presented in Figure 5-3. The City of Clarksburg, City of Fairmount, and WVDOH are MS4 entities in the subject watersheds. MS4 source representation was based upon precipitation and runoff from land uses determined from the modified National Land Cover Database 2006 land use data, the jurisdictional boundary of the cities, and the transportation-related drainage area for which WVDOH has MS4 responsibility. The MS4s in the watershed will be registered under, and subject to the requirements of general permit, WV0110625, which is based upon national guidance and proposes best management practices to be implemented.

There are 93 CSO outlets in the West Fork River watershed that are associated with POTWs operated by Bridgeport, Clarksburg, Fairmount, Shinnston, Weston, Monongah, and Nutter Fork. These systems have Long Term Control Plans, but currently experience frequent stormwater-related CSO discharges and do not have systems in place to store or treat CSO discharges. All fecal coliform bacteria WLAs for CSO discharges have been established at 200 counts/100 ml. Implementation can be accomplished by CSO elimination or by disinfection treatment and discharge in compliance with the operable concentration-based allocations.

General sewage permits are designed to cover like discharges from numerous individual owners and facilities throughout the state. General Permit WV013110 regulates small, privately owned sewage treatment plants ("package plants") and General Permit WV0107000 regulates home aeration units (HAUs). In the areas draining to streams for which fecal coliform TMDLs have been developed, 67 facilities are registered under the "package plant" general permit, one outlet is registered under the WVDOH Municipal Maintenance Facility registration permit, and 611 are registered under the HAU general permit.

Fecal coliform LAs were assigned to: pasture/cropland and on-site sewage systems; including, failing septic systems and straight pipes, residential loadings associated with urban/residential runoff from non-MS4 areas, and loadings associated with wildlife sources. Failing on-site sewage systems are a significant source of fecal coliform bacteria in the West Fork River watershed. There are approximately 10,200 homes in the watershed that are not served by a centralized collection and treatment system and are within 100 meters of a stream. To calculate failing sewage systems, the TMDL watershed was divided into four septic failure zones, and septic failure zones were delineated by soil characteristics.

Chloride TMDLs

Source allocations were developed for all modeled subwatersheds contributing to the chloride impaired streams in the watershed. Permitted, high-volume, pumped discharges associated with mining activities dominate receiving stream flow and necessitate WLAs that are based on achievement of the chronic aquatic life protection criterion discharge. No other point

sources of chloride were identified within the watersheds of chloride impaired streams. Road and impervious surface de-icing activities contribute non-negligible chloride loads to receiving waters and LAs are presented for the non-MS4 urban residential impervious land use. All other sources contributed negligible chloride loadings and were contained within the aggregated LA for Background and Other Nonpoint Sources.

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 forest and 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 sources generally occur during periods of wet weather and high surface runoff. In contrast, critical conditions for non-land-based point source dominated systems generally occur during low flow and low dilution conditions.

Both high-flow and low-flow periods were taken into account during TMDL development for the West Fork River watershed by using a long period of weather data, (January 1, 2004 -- December 31, 2009) that represented wet, dry, and average flow periods. Figure 9-3 presents the range of precipitation conditions that were used for TMDL development.

5. *The TMDLs consider seasonal environmental variations.*

Seasonal variations were considered in the formulation of the MDAS modeling analysis. Continuous simulation (modeling over a period of several years that captured precipitation extremes) inherently considered seasonal hydrological and source loading variability. The metals, chloride, and fecal coliform concentrations simulated on a daily time-step by MDAS and were compared with TMDL endpoints. Allocations that met these endpoints throughout the modeling period were developed.

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 be allocating a portion of the allowable load to the MOS. In the TMDLs developed for the West Fork River watershed, an explicit MOS of five percent was included to counter uncertainty in the modeling process. An implicit MOS was applied for total iron and chloride TMDLs in certain subwatersheds where mining point sources create an effluent dominated scenario and/or the regulated mining activity encompasses a large percentage of the watershed area.

7. The TMDLs have been subject to public participation.

West Virginia held public meetings for the draft TMDLs in the West Fork River watershed on July 27, 2010 and April 21, 2014 at the Waldomore Building and Fairmount State University, respectively. The July 27th meeting included a general TMDL overview and a presentation of planned monitoring and data gathering activities. The April 21st meeting provided information to stakeholders intended to facilitate comments on the draft TMDLs. The availability of the draft TMDLs were advertised in local newspapers beginning on April 10, 2014. Interested parties were invited to submit comments on the draft TMDLs during the public comment period, which began on April 10, 2014 and ended on May 9, 2014.

West Virginia received written comments from Appalachian Mountain Advocates and Sovereign Consulting, Inc. EPA believes that WVDEP appropriately addressed all comments.

IV. Discussion of Reasonable Assurance

Reasonable assurance for maintenance and improvement of water quality in the West Fork River watershed rests primarily with two programs: the NPDES permitting program and the West Virginia Watershed Network. The NPDES permitting program is implemented by WVDEP to control point source discharges. The West Virginia Watershed Network is a cooperative nonpoint source control effort involving many state and federal agencies, whose task is the protection and/or restoration of water quality.

WVDEP's DWWM is responsible for issuing non-mining permits with the State. WVDEP's Division of Mining and Reclamation developed NPDES permits for mining activities. As part of the permit review process, permit writers have the responsibility to incorporate the required TMDL WLAs into new or reissued permits. The permits will contain self-monitoring and reporting requirements that are periodically reviewed by WVDEP. WVDEP also inspects treatment facilities and independently monitors NPDES discharges. The combination of these efforts will ensure implementation of the TMDL WLAs. New facilities will be permitted in accordance with future growth provisions described in Section 11.

The Watershed Management Framework is a tool used to identify priority watersheds and coordinate efforts of state and federal agencies with the goal of developing and implementing watershed management strategies through a cooperative, long-range planning effort. The

principal area of focus of watershed management through the Framework process is correcting problems related to nonpoint source pollution. Network partners have placed a greater emphasis on identification and correction of nonpoint source pollution. The combined resources of the partners are used to address all different types of nonpoint source pollution through both public education and on-the-ground projects. All nonpoint source restoration projects should include a monitoring component specifically designed to document resultant local improvements in water quality. These data may also be used to predict expected pollutant reductions from similar future projects.

Public Sewer Projects

Within WVDEP DWWM, the Engineering and Permitting Branch's Engineering Section will be charged with the responsibility of evaluating sewer projects and providing funding. For information on upcoming projects, a list of funded and pending water and wastewater projects in West Virginia can be found at http://www.wvinfrastructure.com/projects/index.php.

AML Projects

Within WVDEP, the AML&R manages the reclamation of lands and waters affected by mining prior to the passage of the SMCRA in 1977. Funding for reclamation activities is derived from fees placed on coal mines, which are placed in a fund to distribute to state and federal agencies. In AML impacted areas, funds will be used to maximize restoration in fisheries.

Attachment 1

Impaired Waterbodies Addressed in the West Fork River Watershed TMDL

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Mill Fall Run	WV-MW-4	WVMW-1
Little Mill Fall Run	WV-MW-4-A	WVMW-1-A
UNT/Booths Creek RM 4.11	WV-MW-5-D	WVMW-2-0.6A
Sweep Run	WV-MW-5-I	WVMW-2-C
Purdys Run	WV-MW-5-J-1	WVMW-2-D-1
Plummer Run	WV-MW-5-L-7	WVMW-2-E-3
Corbin Branch	WV-MW-5-M	WVMW-2-F
UNT/Corbin Branch RM 2.37	WV-MW-5-M-6	
UNT/Corbin Branch RM 3.36	WV-MW-5-M-8	

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
UNT/Corbin Branch RM 3.65	WV-MW-5-M-9	
UNT/Corbin Branch RM 4.56	WV-MW-5-M-11	
Thomas Fork	WV-MW-5-N	WVMW-2-G
Sugarcamp Run	WV-MW-5-N-3	WVMW-2-G-1
Helens Run	WV-MW-9	WVMW-4
UNT/Helens Run RM 1.77	WV-MW-9-B	
Tevebaugh Creek	WV-MW-10	WVMW-5
Parrish Run	WV-MW-10-C	WVMW-5-A
Camp Run	WV-MW-12	WVMW-6
UNT/Little Bingamon Creek RM 2.27	WV-MW-14-A-4	WVM-7-A-3
UNT/Little Bingamon Creek RM 3.80	WV-MW-14-A-6	
UNT/Cunningham Run RM 1.78	WV-MW-14-F-2	
UNT/Bingamon Creek RM 8.41	WV-MW-14-H	
UNT/Bingamon Creek RM 8.68	WV-MW-14-I	
Big Indian Run	WV-MW-14-N	WVMW-7-E.7
Glade Fork	WV-MW-14-P	WVMW-7-F
Coal Lick Run	WV-MW-14-P-1	WVMW-7-F-1
Crabapple Run	WV-MW-14-P-1-A	WVMW-7-F-1-A
Road Fork	WV-MW-14-P-1-B	WVMW-7-F-1-B
Tucker Fork	WV-MW-14-P-5	WVMW-7-F-3
Harris Fork	WV-MW-14-V	WVMW-7-H
Quaker Fork	WV-MW-14-W	WVMW-7-G
UNT/Mudlick Run RM 1.27	WV-MW-20-A	
UNT/Shinns Run RM 2.81	WV-MW-23-D	
UNT/Shinns Run RM 3.69	WV-MW-23-E	WVMW-11-D
UNT/Shinns Run RM 5.97	WV-MW-23-H	WVMW-11-G
Pigotts Run	WV-MW-26-A	WVMW-12-A
UNT/Tenmile Creek RM 4.19	WV-MW-27-D	
UNT/Little Tenmile Creek RM 0.40	WV-MW-27-E-1	
Peters Run	WV-MW-27-E-2	WVMW-13-B-1
UNT/Bennett Run RM 0.76	WV-MW-27-E-4-A	
Caldwell Run	WV-MW-27-E-5	WVMW-13-B-3
Laurel Run	WV-MW-27-E-7	WVMW-13-B-4
Jake Run	WV-MW-27-E-9	WVMW-13-B-4.5

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Little Elk Creek	WV-MW-27-E-11	WVMW-13-B-5
Barnes Run	WV-MW-27-E-16	WVMW-13-B-8
Mudlick Run	WV-MW-27-E-18	WVMW-13-B-9
Little Isaac Creek	WV-MW-27-H-1	WVMW-13-C-1
Rockcamp Run	WV-MW-27-N	WVMW-13-F
Little Rockcamp Run	WV-MW-27-N-2	WVMW-13-F-1
UNT/Little Rockcamp Run RM 1.22	WV-MW-27-N-2-C	
UNT/Tenmile Creek RM 13.15	WV-MW-27-Q	
Grass Run	WV-MW-27-R	WVMW-13-G
UNT/Grass Run RM 3.26	WV-MW-27-R-7	
Indian Run	WV-MW-27-V	WVMW-13-H
UNT/Indian Run RM 3.07	WV-MW-27-V-7	
Salem Fork	WV-MW-27-X	WVMW-13-I
Raccoon Run	WV-MW-27-X-3	WVMW-13-I-1
Cherrycamp Run	WV-MW-27-X-4	WVMW-13-I-2
Patterson Fork	WV-MW-27-X-8	WVMW-13-I-3
UNT/Patterson Fork RM 0.59	WV-MW-27-X-8-B	WVMW-13-I-3-B
Jacobs Run	WV-MW-27-X-9	WVMW-13-I-4
Rush Run	WV-MW-27-Z	WVMW-13-I.5
Turkey Foot Run	WV-MW-27-AB	WVMW-13-J.5
Wizardism Run (Holt Run)	WV-MW-27-AC	WVMW-13-K
Coburn Fork	WV-MW-27-AM	WVMW-13-N
Shaw Run	WV-MW-27-AM-3	WVMW-13-N-1
Rush Run	WV-MW-27-AP	WVMW-13-O
Turtletree Fork	WV-MW-27-AU	WVMW-13-P
Jack Run	WV-MW-31-B	WVMW-15-A
UNT/Smith Run RM 0.72	WV-MW-31-C-1	
UNT/Simpson Creek RM 5.48	WV-MW-31-D	
UNT/Simpson Creek RM 6.14	WV-MW-31-E	WVMW-15-B.8
Barnett Run	WV-MW-31-F	WVMW-15-C
Stouts Run	WV-MW-31-F-2	WVMW-15-C-1
Davisson Run	WV-MW-31-J	WVMW-15-D
Ann Run	WV-MW-31-K	WVMW-15-E
Peddler Run	WV-MW-31-M	WVMW-15-F
Beards Run	WV-MW-31-O	WVMW-15-G

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Pigtail Run	WV-MW-31-O-3	WVMW-15-G-2
Flag Run	WV-MW-31-U-6	WVMW-15-J-4
Bartlett Run	WV-MW-31-Y	WVMW-15-K
UNT/West Branch RM 1.57/Simpson Creek	WV-MW-31-AA-4	WVMW-15-L-2
UNT/Crooked Run RM 0.47	WV-MW-35-A	
Limestone Run	WV-MW-36	WVMW-20
Stone Coal Run	WV-MW-36-A	WVMW-20-A
Simpson Fork	WV-MW-36-C	WVMW-20-B
UNT/Limestone Run RM 3.97	WV-MW-36-F	
UNT/Elk Creek RM 3.39	WV-MW-37-B	
Ann Moore Run	WV-MW-37-D	WVMW-21-B
UNT/Ann Moore Run RM 2.00	WV-MW-37-D-1	
UNT/Brushy Fork RM 4.59	WV-MW-37-J-5	
Coplin Run	WV-MW-37-J-8	WVMW-21-G-1
Stonecoal Run	WV-MW-37-J-15	WVMW-21-G-3
Chub Run	WV-MW-37-M	WVMW-21-I
Suds Run	WV-MW-37-M-1	WVMW-21-I-1
Fall Run	WV-MW-37-P	WVMW-21-J
Gnatty Creek	WV-MW-37-V	WVMW-21-M
Rooting Creek	WV-MW-37-V-3	WVMW-21-M-1
UNT/Rooting Creek RM 1.54	WV-MW-37-V-3-C	
UNT/Rooting Creek RM 5.22	WV-MW-37-V-3-L	
Raccoon Creek	WV-MW-37-V-6	WVMW-21-M-2
Peeltree Run	WV-MW-37-V-10	WVMW-21-M-3
UNT/Gnatty Creek RM 8.02	WV-MW-37-V-13	
Left Branch/Gnatty Creek	WV-MW-37-V-16	WVMW-21-M-6
Cranes Fork	WV-MW-37-V-16-B	WVMW-21-M-6-A
Right Branch/Gnatty Creek	WV-MW-37-V-15	WVMW-21-M-5
Charity Fork	WV-MW-37-V-15-A	WVMW-21-M-5-A
Arnold Run	WV-MW-37-AC	WVMW-21-P
Isaacs Run	WV-MW-37-AK	WVMW-21-Q
UNT/Stewart Run RM 1.58	WV-MW-37-AM-3	
UNT/Elk Creek RM 27.87	WV-MW-37-AS	WVMW-21-T.7
Indian Fork	WV-MW-37-AT	WVMW-21-U
Davisson Run	WV-MW-40	WVMW-22

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Washburncamp Run	WV-MW-40-B	WVMW-22-A
Browns Creek	WV-MW-45	WVMW-23
Coburns Creek	WV-MW-46	WVMW-24
Sycamore Creek	WV-MW-47	WVMW-25
Lost Creek	WV-MW-55	WVMW-26
UNT/Lost Creek RM 3.32	WV-MW-55-C	WVMW-26-0.5A
UNT/Lost Creek RM 4.77	WV-MW-55-G	
UNT/Lost Creek RM 5.95	WV-MW-55-I	
UNT/Lost Creek RM 6.91	WV-MW-55-K	WVMW-26-B
Buffalo Creek	WV-MW-59	WVMW-27
UNT/Buffalo Creek RM 1.68	WV-MW-59-B	
Duck Creek	WV-MW-62	WVMW-28
UNT/Duck Creek RM 2.78	WV-MW-62-J	WVMW-28-J
UNT/Isaacs Creek RM 2.90	WV-MW-66-E	WVMW-29-D
UNT/West Fork River RM 54.90	WV-MW-68	WVMW-29.9
UNT/West Fork River RM 56.68	WV-MW-71	WVMW-30.9
McKinney Run	WV-MW-72-F	WVMW-31-A
UNT/McKinney Run RM 1.55	WV-MW-72-F-2	
UNT/Jesse Run RM 2.65	WV-MW-72-K-6	
UNT/Jesse Run RM 3.51	WV-MW-72-K-7	
Bills Lick	WV-MW-72-K-8	WVMW-31-C-1
UNT/Jesse Run RM 6.59	WV-MW-72-K-14	
Lifes Run	WV-MW-72-P	WVMW-31-D
Stony Run	WV-MW-72-R	WVMW-31-E
Bloody Run	WV-MW-72-V	WVMW-31-E.5
UNT/Hackers Creek RM 13.79	WV-MW-72-X	
UNT/Laurel Lick RM 1.12	WV-MW-72-Y-3	
Frog Run	WV-MW-72-AA-3	WVMW-31-G-1
Hollick Run	WV-MW-75-A	WVMW-32-A
UNT/Browns Run RM 0.30	WV-MW-75-C-1	WVMW-32-B-1
Stutler Fork	WV-MW-75-G-4	WVMW-32-E-1
Broad Run	WV-MW-77	WVMW-33
Horse Run	WV-MW-83-C	WVMW-36-B
Millstone Run	WV-MW-83-D	WVMW-36-C
Rush Run	WV-MW-83-H-1	WVMW-36-E-1

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Elk Lick Run	WV-MW-83-G-2	WVMW-36-D.5
Keith Fork	WV-MW-89-E	WVMW-39-A
Smith Run	WV-MW-90-B	WVMW-38-A
Mud Lick	WV-MW-90-D	WVMW-38-B
Hilly Upland Run	WV-MW-90-F	WVMW-38-C
Sand Run	WV-MW-93-C	WVMW-41-A
Limestone Run	WV-MW-93-F	WVMW-41-C
Middle Run	WV-MW-94	WVMW-42
Washburn Run	WV-MW-97	WVMW-45
UNT/Glady Fork RM 1.45	WV-MW-90-L-16-D	
Glady Fork	WV-MW-98-F	WVMW-46-B
Hughes Fork	WV-MW-98-O	WVMW-46-G
Skin Creek	WV-MW-98	WVMW-46
Wheeler Fork	WV-MW-98-S	WVMW-46-K
Wildcat Run	WV-MW-98-T	WVMW-46-L
UNT/Skin Creek RM 12.34	WV-MW-98-U	
Keith Fork	WV-MW-98-Q	WVMW-46-I
Sand Fork	WV-MW-112	WVMW-50
Right Fork/West Fork River	WV-MW-132	WVMW-55
McChord Run	WV-MW-132-H	WVMW-55-D
Laurel Run	WV-MW-137	WVMW-58
Wolfpen Run	WV-MW-139	WVMW-59
Fall Run	WV-MW-143	WVMW-60
Crooked Run	WV-MW-144	WVMW-62
Whites Camp Fork	WV-MW-146	WVMW-63
Straight Fork	WV-MW-145	WVMW-61
Canoe Run	WV-MW-111	WVMW-49
West Fork River	WV-MW	WVMW
Upper Portion of West Fork River	WV-MW	WVMW
Booths Creek	WV-MW-5	WVMW-2
UNT/Booths Creek RM 1.39	WV-MW-5-A	WVMW-2-0.1A
UNT/Booths Creek RM 3.58	WV-MW-5-C	WVMW-2-0.5A
UNT/Booths Creek RM 4.81	WV-MW-5-E	WVMW-2-0.8A
Hog Lick Run	WV-MW-5-F	WVMW-2-A
Sapp Run	WV-MW-5-G	WVMW-2-B

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Horners Run	WV-MW-5-J	WVMW-2-D
UNT/Booths Creek RM 8.22	WV-MW-5-K	WVMW-2-D.5
Hustead Fork	WV-MW-5-L	WVMW-2-E
Coons Run	WV-MW-8	WVMW-3
Bingamon Creek	WV-MW-14	WVMW-7
Little Bingamon Creek	WV-MW-14-A	WVMW-7-A
UNT/Little Bingamon Creek RM 1.59	WV-MW-14-A-3	WVMW-7-A-2
Long Run	WV-MW-14-B	WVMW-7-B
Elklick Run	WV-MW-14-C	WVMW-7-C
Cunningham Run	WV-MW-14-F	WVMW-7-D
UNT/Harris Fork RM 0.65	WV-MW-14-V-2	WVMW-7-H-2
UNT/West Fork River RM 11.44	WV-MW-15	WVMW-7.1
Laurel Run	WV-MW-18	WVMW-8
UNT/West Fork River RM 13.10	WV-MW-19	WVMW-8.5
Mudlick Run	WV-MW-20	WVMW-9
UNT/West Fork River RM 13.91	WV-MW-21	WVMW-9.5
Browns Run	WV-MW-22	WVMW-10
Shinns Run	WV-MW-23	WVMW-11
UNT/Shinns Run RM 4.15	WV-MW-23-F	WVMW-11-E
UNT/Shinns Run RM 5.61	WV-MW-23-G	WVMW-11-F
Robinson Run	WV-MW-26	WVMW-12
UNT/Robinson Run RM 1.08	WV-MW-26-B	WVMW-12-B
Tenmile Creek	WV-MW-27	WVMW-13
Jack Run	WV-MW-27-A	WVMW-13-0.5A
Jones Creek	WV-MW-27-B	WVMW-13-A
Nolan Run	WV-MW-27-B-3	WVMW-13-A-1
Little Tenmile Creek	WV-MW-27-E	WVMW-13-B
UNT/Little Tenmile Creek RM 1.91	WV-MW-27-E-3	WVMW-13-B-1.5
Bennett Run	WV-MW-27-E-4	WVMW-13-B-2
Big Elk Creek	WV-MW-27-E-14	WVMW-13-B-6
Middle Run/Little Tenmile Creek	WV-MW-27-E-15	WVMW-13-B-7
Isaac Creek	WV-MW-27-H	WVMW-13-C
Gregory Run	WV-MW-27-I	WVMW-13-D
Katy Lick Run	WV-MW-27-K	WVMW-13-E
Flag Run	WV-MW-27-L	WVMW-13-E.5

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
UNT/Tenmile Creek RM 10.82	WV-MW-27-M	WVMW-13-E.7
UNT/Salem Fork RM 2.43	WV-MW-27-X-2	WVMW-13-I-0.5
UNT/Tenmile Creek RM 22.53	WV-MW-27-AK	WVMW-13-M.5
UNT/West Fork River RM 20.42	WV-MW-30	WVMW-14.2
Simpson Creek	WV-MW-31	WVMW-15
UNT/Simpson Creek RM 1.23	WV-MW-31-A	WVMW-15-0.5A
Smith Run	WV-MW-31-C	WVMW-15-B
Jerry Run	WV-MW-31-P	WVMW-15-H
Berry Run	WV-MW-31-T	WVMW-15-I
Right Fork/Simpson Creek	WV-MW-31-U	WVMW-15-J
UNT/Right Fork RM 0.33/Simpson Creek	WV-MW-31-U-2	WVMW-15-J-0.3
Buck Run	WV-MW-31-U-3	WVMW-15-J-1
Sand Lick Run	WV-MW-31-U-4	WVMW-15-J-2
Gabe Fork	WV-MW-31-U-5	WVMW-15-J-3
UNT/Simpson Creek RM 21.92	WV-MW-31-X	WVMW-15-J.5
UNT/Simpson Creek RM 22.72	WV-MW-31-Z	WVMW-15-K.7
West Branch/Simpson Creek	WV-MW-31-AA	WVMW-15-L
UNT/West Branch RM 0.63/Simpson Creek	WV-MW-31-AA-1	WVMW-15-L-0.5
Stillhouse Run	WV-MW-31-AA-2	WVMW-15-L-1
Camp Run	WV-MW-31-AB	WVMW-15-M
UNT/Simpson Creek RM 26.94	WV-MW-31-AC	WVMW-15-N
Lambert Run	WV-MW-32	WVMW-16
UNT/Lambert Run RM 1.49	WV-MW-32-B	WVMW-16-A
UNT/Lambert Run RM 2.77	WV-MW-32-C	WVMW-16-B
Jack Run	WV-MW-33	WVMW-17
Fall Run	WV-MW-34	WVMW-18
Crooked Run	WV-MW-35	WVMW-19
Johnson Fork	WV-MW-36-D	WVMW-20-C
Phoenix Hollow	WV-MW-36-H	WVMW-20-D
Elk Creek	WV-MW-37	WVMW-21
Murphy Run	WV-MW-37-C	WVMW-21-A
Nutter Run	WV-MW-37-F	WVMW-21-D
Turkey Run	WV-MW-37-G	WVMW-21-E
Hooppole Run	WV-MW-37-H	WVMW-21-F

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Brushy Fork	WV-MW-37-J	WVMW-21-G
UNT/Brushy Fork RM 3.37	WV-MW-37-J-4	WVMW-21-G-0.5
Glade Run	WV-MW-37-J-11	WVMW-21-G-2
Zachs Run	WV-MW-37-L	WVMW-21-H
Hastings Run	WV-MW-37-R	WVMW-21-K
Stouts Run	WV-MW-37-W	WVMW-21-N
Birds Run	WV-MW-37-AA	WVMW-21-O
Stewart Run	WV-MW-37-AM	WVMW-21-S
UNT/West Fork River RM 37.02	WV-MW-43	WVMW-22.8
UNT/Sycamore Creek RM 3.04	WV-MW-47-F	WVMW-25-F
UNT/Lost Creek RM 4.23	WV-MW-55-F	WVMW-26-0.8A
Bonds Run	WV-MW-55-J	WVMW-26-A
Isaacs Creek	WV-MW-66	WVMW-29
Two Lick Creek	WV-MW-69	WVMW-30
Hackers Creek	WV-MW-72	WVMW-31
West Run	WV-MW-72-I	WVMW-31-B
Jesse Run	WV-MW-72-K	WVMW-31-C
Laurel Lick	WV-MW-72-Y	WVMW-31-F
Buckhannon Run	WV-MW-72-AA	WVMW-31-G
Lefthand Fork	WV-MW-72-AJ	WVMW-31-H
Kincheloe Creek	WV-MW-75	WVMW-32
Browns Run	WV-MW-75-C	WVMW-32-B
Right Fork/Kincheloe Creek	WV-MW-75-G	WVMW-32-E
Tanner Fork	WV-MW-75-O	WVMW-32-G
McCann Run	WV-MW-79	WVMW-34
Sycamore Lick	WV-MW-80	WVMW-35
Freemans Creek	WV-MW-83	WVMW-36
Geelick Run	WV-MW-83-A	WVMW-36-A
Mare Run	WV-MW-83-F	WVMW-36-C.5
Left Fork/Freemans Creek	WV-MW-83-H	WVMW-36-E
Right Fork/Freemans Creek	WV-MW-83-G	WVMW-36-D
UNT/West Fork River RM 65.49	WV-MW-85	WVMW-36.4
Maxwell Run	WV-MW-88	WVMW-37
Polk Creek	WV-MW-89	WVMW-39
Dry Fork	WV-MW-89-G	WVMW-39-B

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2012 SECTION 303(d) LIST CODE
Sassafras Run	WV-MW-89-L	WVMW-39-C
Stonecoal Creek	WV-MW-90	WVMW-38
UNT/Stonecoal Creek RM 2.43	WV-MW-90-C	WVMW-38-A.6
Grass Run	WV-MW-90-I	WVMW-38-E
Right Fork/Stonecoal Creek	WV-MW-90-L	WVMW-38-G
Upper Portion of Right Fork/Stonecoal Creek	WV-MW-90-L	WVMW-38-G
Murphy Creek	WV-MW-93	WVMW-41
Rush Run	WV-MW-95	WVMW-43
Stone Lick	WV-MW-96	WVMW-44
Spruce Fork	WV-MW-90-L-17	WVMW-38-G-6
Fall Run	WV-MW-90-L-16-A	WVMW-38-G-7-A
Glady Fork	WV-MW-90-L-16	WVMW-38-G-7
Pringle Fork	WV-MW-90-L-11	WVMW-38-G-3
Linger Run	WV-MW-98-G-8-A	WVMW-46-C-6
Wolf Fork	WV-MW-98-C	WVMW-46-A
Dunkin Run	WV-MW-112-B	WVMW-50-A
Sammy Run	WV-MW-112-M	WVMW-50-E
Big Run	WV-MW-132-C	WVMW-55-A
Sugarcamp Run	WV-MW-132-G	WVMW-55-C
Abrams Run	WV-MW-129	WVMW-54