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

APR 23 2012

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 (dissolved aluminum and total iron), pH, and fecal coliform in the selected streams of the Lower Kanawha River watershed. The TMDLs were established to address impairments of water quality, as identified on West Virginia's 2010 Section 303(d) List. The West Virginia Department of Environmental Protection submitted the report, *Total Maximum Daily Loads for Selected Streams in the Lower Kanawha River Watershed, West Virginia*, to EPA for review and approval on January 26, 2012. 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 Lower Kanawha 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 Selected Streams in the Lower Kanawha River Watershed West Virginia

Jon M. Capacasa, Director
Water Protection Division

Date: 4.23.12

Decision Rationale
Total Maximum Daily Loads for Selected Streams in the Lower Kanawha 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, and fecal coliform bacteria in selected streams of the Lower Kanawha River watershed. The TMDLs were developed to address impairments of water quality as identified in West Virginia's 2010 Section 303(d) list of impaired waters. The West Virginia Department of Environmental Protection (WVDEP) submitted the report, *Total Maximum Daily Loads for Selected Streams in the Lower Kanawha River Watershed, West Virginia*, to EPA on January 26, 2012. 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 Selected Streams in the Lower Kanawha 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 Lower Kanawha River watershed. The majority of impairments in the watershed are new listings that will be identified on West Virginia's 2012

Section 303(d) list. West Virginia identified 221 waterbodies in the Lower Kanawha River watershed as impaired due to exceedances of some combination of the numeric water quality criteria for fecal coliform bacteria, metals (iron and dissolved aluminum), pH, and dissolved oxygen. In addition, certain waters in the Lower Kanawha 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 Lower Kanawha River watershed.

A stressor identification process was used to determine the pollutants for which TMDLs must be developed in the Lower Kanawha 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 I). In the Lower Kanawha River watershed, the stressor identification confirmed the presence of metals (iron and dissolved aluminum), fecal coliform bacteria, low dissolved oxygen, pH, and biological impairments within the watershed. The stressor identification also identified organic enrichment, ionic toxicity, and sedimentation as sources of impairment in the Lower Kanawha River watershed. TMDLs were established for the pollutants that would reduce the sources of impairment within the watershed.

Section 11 presents the TMDLs developed for the Lower Kanawha 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 Lower Kanawha River watershed is located in western West Virginia (Figure 3-1) and encompasses nearly 925 square miles. The watershed extends northwest from the City of Charleston to the Ohio River and lies in portions of Cabell, Kanawha, Jackson, Mason, Putnam and Roane Counties. The major tributaries within the watershed include Pocatalico River, Hurricane Creek, and Eighteen Mile Creek. The dominate land use in the Lower Kanawha River watershed is forest, which constitutes 75.8 percent of the total land use area. Other land use types in the watershed include grassland (6.1%), urban/residential (9.5%), barren (3.8%), and agriculture (4.1%) as shown in Table 3-1. The total population living in the watershed is estimated to be 96,000 people.

West Virginia utilized a stressor identification process to determine the primary causes of impairment in the Lower Kanawha River watershed. Stressor identification was followed by stream-specific determinations of the pollutants for which TMDLs must be developed. Metals, pH, and fecal coliform bacteria stressors were identified in waters that had violations of iron, dissolved aluminum, pH, 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 reduce the organic loading causing the biological impairment in the Lower Kanawha River watershed. 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 Lower Kanawha River watershed. As such, Iron TMDLs are acceptable surrogates for the sediment impairment in the watershed.

Dissolved oxygen was identified as impeding the biological integrity of Little Five Mile Creek (WV-KL-7-A) during the stressor identification process. Little Five Mile Creek is a tributary of Five Mile Creek, and is located within 50 meters of an animal confinement/feeding operation. Pre-TMDL monitoring documented extreme nonattainment with the fecal coliform water quality criteria at this location. The fecal coliform TMDL presented in Section 11 for the Little Five Mile Creek prescribes a 98.5 percent reduction from fecal coliform sources that when successfully implemented will result in the attainment of the dissolved oxygen criteria as well. As such, the fecal coliform TMDL for Little Five Mile Creek is an appropriate surrogate for the dissolved oxygen impairment.

The stressor identification process indicated that there was a strong presence of sulfates and other dissolved solids in Joplin Branch (WV-KL-77). Joplin Branch is a tributary of the Lower Kanawha River and is located in the city of South Charleston. WVDEP is deferring biological TMDL development for ionic toxicity stressed streams. WVDEP and EPA are working to develop an impairment threshold for toxicity. Table 4-1 summarizes the stressors identified for each biologically impaired stream in the Lower Kanawha River watershed and the TMDLs developed to address the biological impairments.

Sections 5, 6, 7, 8 and 9 discuss the metals, pH, dissolved oxygen, fecal coliform bacteria and sediment source assessments in the Lower Kanawha River watershed. The sources of metals and sediment in the watershed include: mining permits, sewage treatment facilities, 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, and other land disturbance activities. There are no unreclaimed bond forfeiture sites that discharge into the impaired waters of the Lower Kanawha River watershed. The pH impairments in the watershed have been attributed to two source categories: discharges from AML and acid precipitation. 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 Lower Kanawha River watershed.

Computational Procedures

The Mining Data Analysis System (MDAS) was used to represent the source-response linkage in the Lower Kanawha River watershed TMDL for dissolved aluminum, total iron, pH, sediment 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 10-1). 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 three times to simulate loading conditions for the following pollutant groups in the Lower Kanawha River watershed: iron/sediment, aluminum/pH and fecal coliform bacteria.

The calibrated model provides the basis for performing the allocation analysis. The first step is to determine the baseline conditions of the subwatersheds, which represents existing nonpoint source loadings and point source loadings at permit limits. The 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, 1998 through December 31, 2003). 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, and fecal coliform bacteria in the 211 impaired waterbodies of the Lower Kanawha River watershed. The TMDLs are shown in Section 11 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, dissolved oxygen, 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 waterbodies of the Lower Kanawha River watershed, warmwater fishery aquatic life use impairments have been determined pursuant to exceedances of iron, dissolved aluminum, dissolved oxygen, and 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, dissolved oxygen 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 11 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. In the TMDLs developed for the Lower Kanawha River watershed, a five percent explicit MOS was used to account for uncertainty in the pollutant loads developed for the metals, pH and fecal coliform bacteria impairments in the watershed.

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. 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 three mining related NPDES permits with eight associated outlets in the metals impaired waters of the Lower Kanawha 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 1.5 or 2.5 percent of the modeled subwatershed area to be registered under the general permit at any point in time.

There are 57 modeled non-mining NPDES permitted outlets in the Lower Kanawha River watershed. Thirty-one of the non-mining permits regulate stormwater associated with industrial activity and implement benchmark values of 100 mg/L TSS, and/or 1.0 mg/L total iron. Two outlets in the watershed are associated with groundwater remediation and are subject to a 1.2 mg/L monthly average total iron limitation. There are also five individual industrial outlets, three wastewater treatment plants and 16 solid waste landfills in the Lower Kanawha River watershed. 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 Lower Kanawha River watershed is provided in Appendix G 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 is associated with bank condition and upland imperviousness. The streambank erosion modeling process is discussed in Section 10.2.2. The oil and gas data incorporated into the TMDL model were obtained from the WVDEP GIS coverage. There are 1,150 active oil and gas wells in the metals impaired TMDL watershed. Runoff from unpaved access roads to these wells and disturbed areas around the wells contribute sediment to adjacent streams (Figure 5-4).

The Office of Abandoned Mine Lands and Reclamation (AML&R) identified locations of AML in the Lower Kanawha 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 measures were collected to represent AML sources and characterize their impact on water quality. In the TMDL watershed, a total of 2,364 acres of AML area, five AML seeps, and 37 acres of highwall 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 Lower Kanawha River watershed. Sources of total iron were reduced prior to total aluminum reduction because existing instream iron concentrations can significantly reduce pH and consequentially increase dissolved aluminum concentrations. In four subwatersheds of the Lower Kanawha River watershed, the dissolved aluminum and/or pH TMDL endpoints were not attained after source reductions to iron. Therefore, the total aluminum loading from AML 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. There are no point sources that discharge dissolved aluminum or pH to the impaired streams of the Lower Kanawha River watershed.

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 Lower Kanawha River watershed, there are two publicly owned treatment works (POTW) that discharge treated effluent and 231 general sewage treatment plants. 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 cities of Charleston, South Charleston, Nitro, and Hurricane, as well as the West Virginia Division of Highways (WVDOH), are MS4 entities in the Lower Kanawha River watershed. MS4 source representation was based upon precipitation and runoff from land uses determined from the modified National Land Cover Database 2001 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 subject to the requirements of general permit, WV0110625, which is based upon national guidance and proposes best management practices to be implemented.

There are eight CSO outlets in the Lower Kanawha River watershed that are associated with POTWs operated by the Charleston Sanitary Board and the City of Nitro. 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.

Fecal coliform LAs were assigned to: pasture/cropland and on-site sewage systems; including, failing septic systems and straight pipes, and loadings associated with wildlife sources. Failing on-site sewage systems are a significant source of fecal coliform bacteria in the Lower Kanawha River watershed. There are 16,700 homes in the watershed that are not served by a centralized collection and treatment system. To calculate failing sewage systems, the TMDL watershed was divided into four septic failure zones, and septic failure zones were delineated by soil characteristics.

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 Lower Kanawha River watershed by using a long period of weather data, (January 1, 1998 -- December 31, 2003) that represented wet, dry, and average flow periods. Figure 10-4 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 and fecal coliform concentrations were then simulated on a daily time-step by MDAS and were compared with TMDL endpoints.

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 Lower Kanawha River watershed, an explicit MOS of five percent was included to counter uncertainty in the modeling process.

7. The TMDLs have been subject to public participation.

West Virginia held public meetings for the draft TMDLs in the Lower Kanawha River watershed on May 29, 2007, October 26, 2010, and September 28, 2011, at Winfield High School. The May 29, 2007, meeting included a general TMDL overview and a presentation of planned monitoring and data gathering activities. The October 26, 2010, meeting provided a description of the status of TMDL development. The September 28, 2011, meeting provided information to stakeholders intended to facilitate comments on the draft TMDLs. The availability of the draft TMDLs were advertised in local newspapers between September 12, 2011 and September 15, 2011. Interested parties were invited to submit comments on the draft TMDLs during the public comment period, which began on September 12, 2011, and ended on October 14, 2011.

West Virginia received written comments by the Charleston Sanitary Board during the public participation period for the proposed TMDLs. The Charleston Sanitary Board contended that the WLAs developed for fecal coliform bacteria were inconsistent with National CSO Policy, which recommends an 85% reduction of overflow events. The WLAs for the Charleston CSO in these TMDLs prescribes a 99.8 % reduction of fecal coliform bacteria load to attain currently effective West Virginia Water Quality Standards. This reduction reflects USEPA guidance that prohibit mixing zones for fecal coliform bacteria.

IV. Discussion of Reasonable Assurance

Reasonable assurance for maintenance and improvement of water quality in the Lower Kanawha 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 12.

The Watershed Management Framework coordinates 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.

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. This 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 Lower Kanawha River Watershed TMDL

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Ninemile Creek	WV-KL-12	WVK-9
UNT/ Ninemile Creek RM 0.27	WV-KL-12-A	
Upper Ninemile Creek	WV-KL-12-B	WVK-9-A
Middle Ninemile Creek	WV-KL-12-D	WVK-9-B
UNT/Ninemile Creek RM 3.25	WV-KL-12-E	WVK-9-C
Cooper Fork	WV-KL-15-C	WVK-10-A
UNT/Cooper Fork RM 1.41	WV-KL-15-C-1	WVK-10-A-1
UNT/UNT RM 0.39/Cooper Fork RM 1.41	WV-KL-15-C-1-A	
UNT/Cooper Fork RM 3.40	WV-KL-15-C-6	
Pond Branch	WV-KL-17	WVK-11
UNT/Pond Branch RM 1.4	WV-KL-17-A	WVK-11-0.5A
UNT/Pond Branch RM 1.88	WV-KL-17-B	
Thirteenmile Creek	WV-KL-19	WVK-12
Long Hollow	WV-KL-19-AC	WVK-12-K
Little Spruce Run	WV-KL-19-AF	WVK-12-L
Peppermint Creek	WV-KL-19-AM	WVK-12-M
Rocky Fork	WV-KL-19-D	WVK-12-A
UNT/Rocky Fork RM 0.69	WV-KL-19-D-1	
Tom Allen Creek	WV-KL-19-F	WVK-12-B
Buzzard Creek	WV-KL-19-H	WVK-12-D
Mudlick Fork	WV-KL-19-M	WVK-12-E
Bailey Branch	WV-KL-19-M-15	WVK-12-E-3
Sapsucker Run	WV-KL-19-M-8	WVK-12-E-1
Beech Fork	WV-KL-19-M-9	WVK-12-E-2
Poplar Fork	WV-KL-19-N	WVK-12-F
UNT/Poplar Fork RM 4.81	WV-KL-19-N-6	
UNT/Thirteenmile Creek RM15.64	WV-KL-19-O	
UNT/Thirteenmile Creek RM 15.82	WV-KL-19-P	
Yeager Fork	WV-KL-19-R	WVK-12-G

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Baker Branch	WV-KL-19-X	WVK-12-H
Spruce Run	WV-KL-19-Z	WVK-12-I
Little Sixteenmile Creek	WV-KL-20	WVK-13
Shady Fork	WV-KL-20-D	WVK-13-A
Sixteenmile Creek	WV-KL-22	WVK-14
Slaty Hollow	WV-KL-22-A	WVK-14-0.2A
UNT/Sixteenmile Creek RM 8.16	WV-KL-22-L	WVK-14-A.5
Eighteenmile Creek	WV-KL-27	WVK-16
Sulug Branch	WV-KL-27-AA	WVK-16-L
Cherry Fork	WV-KL-27-AB	WVK-16-M
Stumpy Run	WV-KL-27-AB-3	WVK-16-M-1
Painters Branch	WV-KL-27-AB-4	WVK-16-M-2
Sigman Fork	WV-KL-27-AB-6	WVK-16-M-3
Clendenin Creek	WV-KL-27-AF	WVK-16-O
Harris Branch	WV-KL-27-AH	WVK-16-Q
Buckelew Hollow	WV-KL-27-AK	WVK-16-R
Cottrell Run	WV-KL-27-AL	WVK-16-S
UNT/Eighteenmile Creek RM 2.84	WV-KL-27-D	
Otter Branch	WV-KL-27-E	WVK-16-0.5A
Jakes Run	WV-KL-27-H	WVK-16-B
Isaacs Branch	WV-KL-27-K	WVK-16-C
Lukes Branch	WV-KL-27-L	WVK-16-D
Dads Branch	WV-KL-27-M	WVK-16-E
Bear Branch	WV-KL-27-N	WVK-16-F
Turkey Branch	WV-KL-27-P	WVK-16-G
Left Fork/Turkey Branch	WV-KL-27-P-3	WVK-16-G-1
Buffalo Branch	WV-KL-27-S	WVK-16-I
Right Fork/Eighteenmile Creek	WV-KL-27-X	WVK-16-J
Slab Hollow	WV-KL-27-X-3	WVK-16-J-1
Bucklick Creek	WV-KL-27-X-7	WVK-16-J-2
Saltlick Creek	WV-KL-27-X-8	WVK-16-J-3
Spring Valley Branch	WV-KL-27-Y	WVK-16-K
Five And Twenty Mile Creek	WV-KL-35	WVK-19
Honeycutt Run	WV-KL-35-A	WVK-19-A

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Stave Branch	WV-KL-35-B	WVK-19-A.5
Evans Creek	WV-KL-35-E	WVK-19-B
Barnett Branch	WV-KL-35-E-1	WVK-19-B-1
UNT/Evans Creek RM 1.92	WV-KL-35-E-4	
UNT/Evans Creek RM 2.30	WV-KL-35-E-5	
UNT/Five And Twenty Mile Creek RM 7.41	WV-KL-35-H	WVK-19-D
UNT/Little Buffalo Creek RM 1.17	WV-KL-40-A	WVK-20-A
UNT/UNT RM 0.44/Little Buffalo Creek RM 1.17	WV-KL-40-A-1	WVK-20-A-1
Hurricane Creek	WV-KL-42	WVK-22
Trace Fork	WV-KL-42-AC	WVK-22-G
Buffs Branch	WV-KL-42-AF	WVK-22-H
Joes Branch	WV-KL-42-AL	WVK-22-I
Rider Creek	WV-KL-42-AO	WVK-22-J
Sams Fork	WV-KL-42-AQ	WVK-22-K
UNT/Hurricane Creek RM 1.64	WV-KL-42-D	
Poplar Fork	WV-KL-42-I	WVK-22-B
Long Branch	WV-KL-42-I-10	WVK-22-B-3
Rockstep Run	WV-KL-42-I-10-C	WVK-22-B-3-A
UNT/Long Branch RM 1.25	WV-KL-42-I-10-D	
Crooked Creek	WV-KL-42-I-16	WVK-22-B-5
UNT/Crooked Creek RM 0.72	WV-KL-42-I-16-B	WVK-22-B-5-B
UNT/Poplar Fork RM 9.86	WV-KL-42-I-17	
Sugar Branch	WV-KL-42-I-3	WVK-22-B-1
Cow Creek	WV-KL-42-I-4	WVK-22-B-2
UNT/Cow Creek RM 2.33	WV-KL-42-I-4-F	
UNT/Poplar Fork RM 3.78	WV-KL-42-I-5	
Lick Branch	WV-KL-42-I-9	
Sleepy Creek	WV-KL-42-N	WVK-22-C
Trace Creek	WV-KL-42-N-2	WVK-22-C-2
Mill Creek	WV-KL-42-U	WVK-22-F
Tackett Branch	WV-KL-42-U-1	WVK-22-F-1
UNT/Mill Creek RM 1.02	WV-KL-42-U-2	

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Little Hurricane Creek	WV-KL-46	WVK-24
Long Branch	WV-KL-46-A	WVK-24-A
UNT/Little Hurricane Creek RM 1.35	WV-KL-46-B	
Harmon Branch	WV-KL-46-D	WVK-24-B
Morrison Fork	WV-KL-46-E	WVK-24-C
Lick Run	WV-KL-46-I	WVK-24-D
Threemile Creek (South)	WV-KL-5	WVK-4
Farley Creek	WV-KL-54	WVK-27
Bills Creek	WV-KL-56	WVK-28
UNT/Bills Creek RM 0.81	WV-KL-56-A	
Pocatalico River	WV-KL-57	WVKP
Grapevine Creek	WV-KL-57-AA	WVKP-16
Right Fork	WV-KL-57-AA-2	WVKP-16-A
Boardtree Run	WV-KL-57-AA-4	WVKP-16-B
Pocatalico Creek	WV-KL-57-AD	WVKP-17
Dog Fork	WV-KL-57-AD-10	WVKP-17-F
Gays Branch	WV-KL-57-AD-14	WVKP-17-J
Middle Fork/Pocatalico Creek	WV-KL-57-AD-2	WVKP-17-B
Sugar Creek	WV-KL-57-AD-2-H	WVKP-17-B-4
First Creek	WV-KL-57-AD-2-K	WVKP-17-B-5
Laurel Fork	WV-KL-57-AD-2-P	WVKP-17-B-8
Allen Fork	WV-KL-57-AD-3	WVKP-17-C
Trace Fork	WV-KL-57-AD-3-B	WVKP-17-C-1
Dudden Fork	WV-KL-57-AD-9	WVKP-17-E
Raccoon Creek	WV-KL-57-AL	WVKP-20
Leatherwood Creek	WV-KL-57-AO	WVKP-22
Hicumbottom Run	WV-KL-57-AP	WVKP-23
Goose Creek	WV-KL-57-AR	WVKP-25
Camp Creek	WV-KL-57-AT	WVKP-26
Allen Creek	WV-KL-57-AU	WVKP-27
Green Creek	WV-KL-57-AV	WVKP-28
Coleman Fork	WV-KL-57-AV-3	WVKP-28-A
Left Fork/Green Creek	WV-KL-57-AV-4	WVKP-28-B
Rush Fork	WV-KL-57-AV-6	WVKP-28-C

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
Straight Creek	WV-KL-57-AX	WVKP-29
White Oak Run	WV-KL-57-AZ	WVKP-30
Red Oak Run	WV-KL-57-BB	WVKP-31
Wolf Creek	WV-KL-57-BE	WVKP-32
Flat Fork	WV-KL-57-BH	WVKP-33
Trace Fork	WV-KL-57-BH-1	WVKP-33-A
Cabbage Fork	WV-KL-57-BH-13	WVKP-33-G
Wolfpen Run	WV-KL-57-BH-13-A	WVKP-33-G-1
Higby Run	WV-KL-57-BH-3	WVKP-33-B
Payne Hollow	WV-KL-57-BH-3-A	WVKP-33-B-1
Cox Fork	WV-KL-57-BH-8	WVKP-33-E
Wolfcamp Run	WV-KL-57-BH-8-B	WVKP-33-E-1
Coon Creek	WV-KL-57-BH-8-D	WVKP-33-E-2
Rock Creek	WV-KL-57-BK	WVKP-35
Big Creek	WV-KL-57-BN	WVKP-36
McKown Creek	WV-KL-57-BQ	WVKP-37
Left Hand Run	WV-KL-57-BQ-3	WVKP-37-B
Johnson Creek	WV-KL-57-BT	WVKP-38
Jackson Fork	WV-KL-57-BT-10	
Greathouse Hollow	WV-KL-57-BT-4	WVKP-38-0.8A
Pad Fork	WV-KL-57-BT-6	WVKP-38-B
Big Lick Run	WV-KL-57-BU	WVKP-39
Silcott Fork	WV-KL-57-BU-2	WVKP-39-A
UNT/Silcott Fork RM 1.96	WV-KL-57-BU-2-B	
Bear Fork	WV-KL-57-BU-4	WVKP-39-C
Round Knob Run	WV-KL-57-BV	WVKP-40
Rush Creek	WV-KL-57-BX	WVKP-41
Slab Fork	WV-KL-57-BX-1	WVKP-41-A
Laurel Fork	WV-KL-57-CD	WVKP-43
Flat Fork	WV-KL-57-CF	WVKP-44
Claybank Branch	WV-KL-57-F	WVKP-1.8
UNT/Pocatalico River RM 8.52	WV-KL-57-I	WVKP-2.5
Kelly Creek	WV-KL-57-J	WVKP-3
Harmond Creek	WV-KL-57-K	WVKP-4

STREAM NAME	WEST VIRGINIA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
UNT/Harmond Creek RM 1.00	WV-KL-57-K-2	WVKP-4-B
Rocky Fork	WV-KL-57-L	WVKP-5
Lick Branch	WV-KL-57-L-1	WVKP-5-0.5A
UNT/Rocky Fork RM 4.32	WV-KL-57-L-10	WVKP-5-B.5
Howard Fork	WV-KL-57-L-14	WVKP-5-C
Fisher Branch	WV-KL-57-L-3	WVKP-5-A
Wolfpen Run	WV-KL-57-L-4	WVKP-5-B
Martin Branch	WV-KL-57-N	WVKP-7
Schoolhouse Branch	WV-KL-57-O	WVKP-8
Campbells Branch	WV-KL-57-P	WVKP-8.5
Kelly Creek	WV-KL-57-Q	WVKP-9
UNT/Kelly Creek RM 0.51	WV-KL-57-Q-1	WVKP-9-0.5A
Spring Branch	WV-KL-57-Q-2	WVKP-9-A
Frog Creek	WV-KL-57-R	WVKP-10
Grasslick Run	WV-KL-57-R-8	WVKP-10-C
Tanner Fork	WV-KL-57-R-9	WVKP-10-D
Derrick Creek	WV-KL-57-U	WVKP-12
UNT/Pocatalico River RM 23.03	WV-KL-57-X	
Threemile Creek (North)	WV-KL-6	WVK-5
Armour Creek	WV-KL-60	WVK-30
Blakes Creek	WV-KL-60-C	WVK-30-A
UNT/Armour Creek RM 3.25	WV-KL-60-D	
UNT/Armour Creek RM 3.54	WV-KL-60-E	
Scary Creek	WV-KL-63	WVK-32
UNT/Scary Creek RM 0.14	WV-KL-63-A	WVK-32-0.1A
Rockstep Run	WV-KL-63-C	WVK-32-A
UNT/Rockstep Run RM 0.82	WV-KL-63-C-2	
UNT/Scary Creek RM 2.13	WV-KL-63-E	WVK-32-B
UNT/UNT RM 0.33/Scary Creek RM 2.13	WV-KL-63-E-1	WVK-32-B-1
UNT/Scary Creek RM 3.84	WV-KL-63-H	
Gallatin Branch	WV-KL-64	WVK-33

STREAM NAME	WEST VIRGINA NATIONAL HYDROLOGY DATASET CODE	WEST VIRGINIA 2010 SECTION 303(d) LIST CODE
UNT/Gallatin Branch RM 0.47	WV-KL-64-A	
UNT/Threemile Creek RM 2.61	WV-KL-6-B	
UNT/Threemile Creek RM 7.11	WV-KL-6-F	
UNT/Threemile Creek RM 8.65	WV-KL-6-H	
Fivemile Creek	WV-KL-7	WVK-6
Davis Creek	WV-KL-74	WVK-39
Ward Hollow	WV-KL-74-B	WVK-39-A
Trace Fork	WV-KL-74-C	WVK-39-B
Mudsuck Branch	WV-KL-74-C-2	WVK-39-B-1
Pot Branch	WV-KL-74-C-4	WVK-39-B-2
Sugarcamp Creek	WV-KL-74-D	WVK-39-C
Dry Branch	WV-KL-74-E	WVK-39-D
Middle Fork/Davis Creek	WV-KL-74-F	WVK-39-E
Long Branch	WV-KL-74-F-2	WVK-39-E-1
Rays Branch	WV-KL-74-G	WVK-39-F
Kirby Hollow	WV-KL-74-K	WVK-39-I
Coal Hollow	WV-KL-74-L	WVK-39-J
Cane Fork	WV-KL-74-N	WVK-39-L
UNT/Cane Fork RM 0.83	WV-KL-74-N-1	
Kanawha Fork	WV-KL-74-O	WVK-39-M
Middlelick Branch	WV-KL-74-O-1	WVK-39-M-1
Hoffman Hollow	WV-KL-74-O-1-A	WVK-39-M-1-A
Joplin Branch	WV-KL-77	WVK-42
Little Fivemile Creek	WV-KL-7-A	WVK-6-A
UNT/Fivemile Creek RM 2.40	WV-KL-7-B	
Lower Fivemile Creek	WV-KL-7-C	WVK-6-C
Upper Fivemile Creek	WV-KL-7-D	WVK-6-B