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

APR 27 2015

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

Dear Mr. Mandirola:

The United States Environmental Protection Agency (EPA), Region III, is pleased to approve the Total Maximum Daily Loads (TMDLs) developed for total iron and fecal coliform in the South Branch Potomac River and Shenandoah River watersheds. 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 Select Streams in the South Branch Potomac River and Shenandoah River Watersheds*, to EPA for review and approval on January 7, 2015. 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 South Branch Potomac River and Shenandoah River watersheds 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. Jennifer Sincock, West Virginia TMDL Coordinator, at 215-814-5766.

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
Select Streams in the South Branch Potomac River and Shenandoah River Watersheds, West Virginia

Jon M. Capacasa, Director
Water Protection Division

Date: 4/27/2015

Decision Rationale
Total Maximum Daily Loads for
Select Streams in the South Branch Potomac River and
Shenandoah River Watersheds, 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 (total iron) and fecal coliform bacteria in select streams of the South Branch Potomac River and Shenandoah River watersheds. 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 Select Streams in the South Branch Potomac River and Shenandoah River Watersheds*, to EPA for final review on January 7, 2015, and was received on January 15, 2015. 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 Select Streams in the South Branch Potomac River and Shenandoah River Watersheds, 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 South Branch Potomac River and Shenandoah River watersheds. West Virginia identified 41 streams in the South Branch Potomac River and Shenandoah River watersheds as impaired due to exceedances of some combination of the numeric water quality criteria for fecal coliform bacteria and metals (total iron). In addition, certain waters in the South Branch Potomac River and Shenandoah River watersheds 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 South Branch Potomac River and Shenandoah River watersheds.

Section 9 presents the TMDLs developed for the South Branch Potomac River and Shenandoah River watersheds 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 spreadsheets present TMDLs 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 South Branch Potomac River Watershed is located in the Central Appalachian Ridge and Valley Ecoregion and encompasses 1,372 square miles in eastern West Virginia (Figure 3-1). Of the 1,372 total square miles in the West Virginia portion of the watershed, only 233 square miles were modeled under this TMDL effort. The South Branch headwaters begin in Highland County, Virginia, and flow across the state line into Pendleton County in West Virginia. The river flows north, joined by its two major tributaries the North and South Forks, to its confluence with the Potomac River at Green Spring. The watershed lies in portions of West Virginia's Pendleton, Hardy, Grant, and Hampshire counties. Tributary streams considered in this TMDL effort include Buffalo Creek, Mudlick Run, Anderson Run, South Fork of Lunice Creek, Robinson Run, Jordan Run, Mill Creek, and Deer Run. Cities and towns in the vicinity of the area of study are Romney, Moorefield, Petersburg and Franklin.

The Shenandoah River Watershed is located in the Central Appalachian Ridge and Valley ecoregion and encompasses 2,937 square miles in Virginia and West Virginia (Figure 3-1). In West Virginia, and in cross-border areas of Virginia draining to West Virginia TMDL streams, only 8.7 square miles were modeled under this TMDL effort. The majority of the Shenandoah River Watershed falls within the state of Virginia. However, several small headwater streams are located in Hardy County, West Virginia, in close proximity to the South Branch Potomac River Watershed. These streams exit West Virginia as they flow across the state line into Virginia. Many miles downstream, the Shenandoah River re-enters West Virginia near its confluence with the Potomac

River at Harpers Ferry in Jefferson County. The modeled portion of the Shenandoah River Watershed lies in Hardy County, West Virginia and Rockingham County, Virginia. Tributary streams considered in this TMDL effort are UNT/Capon Run RM 4.49 and Crab Run. The community of Mathias in Hardy County is located several miles north of the modeled watersheds.

The dominant land use in both watersheds is forest, which constitutes 75.85 percent of the total land use area. Other important modeled land use types are grassland (10.97%), pasture (7.35%), urban/residential (3.82%) and forestry (1.09%) as shown in Table 3-1. The total population living in the South Branch Potomac River and Shenandoah River watersheds is estimated to be 75,000 people and less than 200 people, respectively.

The impaired streams that are the subject of this TMDL are included on West Virginia's 2012 Section 303(d) List. Documented impairments are related to numeric water quality criteria for total iron and fecal coliform bacteria. Certain waters are also biologically impaired based on the narrative water quality criterion of 47 CSR 2–3.2.i. West Virginia utilized a stressor identification process to determine the primary causes of impairment in the nine streams listed as biologically impaired within the South Branch Potomac River and Shenandoah River watersheds. 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). Stressor identification was followed by stream-specific determinations of the pollutants for which TMDLs must be developed. When the stressor identification process identified that a specific pollutant with numeric criteria was a causative stressor, TMDLs were developed for that pollutant.

The stressor identification identified organic enrichment and/or sedimentation as sources of impairment in six waters where water quality monitoring data indicated violations of the fecal coliform bacteria and iron water quality criteria. The predominant sources of both organic enrichment and fecal coliform bacteria in this watershed are inadequately treated sewage and runoff from agricultural land uses. For the organic enrichment impairment identified in the watersheds, 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. Additionally, fecal coliform TMDLs will also serve as a surrogate to the dissolved oxygen impairments. For the sediment impairment identified in the watersheds, 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 watershed. As such, iron TMDLs are acceptable surrogates for the sediment impairment in the watershed.

For the other three biologically impaired streams, the stressor identification process did not indicate that TMDLs for numeric criteria would resolve the biological impacts (Appendix K). In these waters, the stressor identification process was inconclusive due to incomplete data and West Virginia will therefore retain those waters on the Section 303(d) list.

Sections 5, 6, and 7 discuss the metals, fecal coliform bacteria, and dissolved oxygen

source assessments in the South Brach Potomac River and Shenandoah River watersheds. The identified point sources of metals and sediment in the watersheds include: mining permits, non-mining permits for industrial stormwater discharges and construction stormwater permits. The nonpoint sources of metals and sediment in the watersheds include: forestry, oil and gas, roads, agriculture, streambank erosion, and other land disturbance activities. The identified fecal coliform bacteria sources in the watershed include: general sewage permits and unpermitted sources such as on-site treatment systems, stormwater runoff from residential and urbanized areas, agriculture, and natural background (wildlife). The following fecal coliform point sources were not found in the TMDL watersheds: individually permitted POTWs, CSO or significant SSO discharge, MS4s and facilities registered under the HAU general permit. The dissolved oxygen impairment was attributed to organic enrichment by livestock manure. The technical report has expanded details of the source assessment in the South Branch Potomac River and Shenandoah watersheds.

Computational Procedures

The Mining Data Analysis System (MDAS) was used to represent the source-response linkage in the South Branch Potomac River watershed and Shenandoah River watershed TMDLs for total iron 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 in-stream water quality. MDAS is capable of simulating different flow regimes and pollutant loading 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 watersheds into subwatersheds modeling units connected by stream reaches. The 13 TMDL watersheds were broken into 199 separate subwatershed units, based on the groupings of impaired streams shown in Figure 3-2. The TMDL watersheds 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 to simulate loading conditions for the following pollutant groups in the South Brach Potomac River and Shenandoah River watersheds: iron/sediment 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 in-stream 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 in-stream 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 fecal coliform bacteria in the 46 impaired streams of the South Branch Potomac River and Shenandoah River watersheds. The TMDLs are shown in Section 9 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 oxygen 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 TMDL project watersheds, warmwater fishery aquatic life use impairments have been determined pursuant to exceedances of total iron and dissolved oxygen 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 general provisions relative to water quality. The TMDLs presented in Section 9 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 units. 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 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. All allocations were established at technology based limits. Four NPDES permits with 25 associated outlets exist for non-coal mining facilities in the iron impaired waters of the South Branch Potomac and Shenandoah River watersheds. There are no existing permitted coal mining facilities. WVDEP Division of Water and Waste Management (DWWM) personnel used information contained in the Surface Mining Control and Reclamation Act (SMCRA) and NPDES permits to further 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.

Certain registrations under the general permit for stormwater associated with industrial activity implement TSS and/or iron benchmark values. Facilities that are compliant with such limitations are not considered to be significant sources of sediment or iron. Facilities that are present in the watersheds of iron-impaired streams are assigned WLAs that allow for continued discharge under existing permit conditions

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 2.5 percent of the modeled subwatershed area to be registered under the general permit at any point in time.

There are 9 non-mining NPDES permits with 18 permitted outlets in the South Branch Potomac River and Shenandoah River watersheds. The WLAs for all non-mining NPDES outlets allow for continued discharge under existing permit requirements. A complete list of the permits and outlets is provided in Appendix F of the Technical Report.

Total iron LAs were allocated to the dominant nonpoint sources of iron in the watershed, including: sediment contributions from barren lands, harvested forest, oil and gas operations, agricultural land uses, residential/urban/road land uses and streambank erosion. Background loading from undisturbed forest and grasslands were also included. Streambank erosion has been determined to be a significant sediment source in the watershed. The streambank erosion modeling process is discussed in Section 8.2.2.

Fecal Coliform Bacteria TMDLs

WLAs were developed for all facilities permitted to discharge fecal coliform bacteria. In the areas draining to streams for which fecal coliform TMDLs have been developed, 3 facilities are registered under the "package plant" general permit. 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). These point sources are regulated by NPDES permits, which have effluent limitations more stringent than water quality criteria; therefore, all effluent discharges from sewage treatment plants were given WLAs equal to existing monthly fecal coliform effluent limitations of 200 counts/100 mL. In the South Branch Potomac River and Shenandoah River watersheds, there are no individually permitted publicly owned treatment works (POTW). Additionally, there are no facilities registered under the HAU general permit.

There are no CSOs or significant SSO discharges in the South Branch Potomac River and Shenandoah River TMDL watersheds. Furthermore, there are no MS4 entities in the TMDL watersheds.

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, and background loadings associated with wildlife sources. Failing on-site sewage systems are a significant source of fecal coliform bacteria in the South Branch Potomac River and Shenandoah River watersheds. Based on information collected during source tracking efforts by WVDEP, it's estimated that 1,072 homes in the TMDL watersheds 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.

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 undisturbed forests 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 South Branch Potomac River and Shenandoah River watersheds by using a long period of weather data (January 1, 2004 -- December 31, 2009) that represented wet, dry, and average flow

periods. Figure 8-3 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 hydrologic and source loading variability. The total iron, dissolved oxygen, and fecal coliform concentrations simulated on a daily time-step by MDAS 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 South Branch Potomac River and Shenandoah River watersheds, an explicit MOS of five percent was included to counter uncertainty in the modeling process.

7. The TMDLs have been subject to public participation.

An informational public meeting was held on June 7, 2011 at the Moorefield High School in Moorefield, WV. The June 7, 2011 meeting occurred prior to pre-TMDL stream monitoring and pollutant source tracking, and included a general TMDL overview and a presentation of planned monitoring and data gathering activities. A TMDL status update meeting was held at Moorefield City Hall in Moorefield on August 6, 2014. A public meeting was held to present the draft TMDLs on November 5, 2014 at Moorefield City Hall. The meeting provided information to stakeholders, and was intended to facilitate comments on the draft TMDLs.

The availability of draft TMDLs was advertised in various local newspapers beginning on October 23, 2014. Interested parties were invited to submit comments during the public comment period, which began on October 23, 2014 and ended on November 21, 2014. West Virginia received two sets of written comments which were addressed in Section 11.3 of the final TMDL report.

IV. Discussion of Reasonable Assurance

Reasonable assurance for maintenance and improvement of water quality in the South Branch Potomac River and Shenandoah River watersheds 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 10.

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.

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.

For more details about Reasonable Assurance for this TMDL refer to Section 12 of the TMDL report.

Attachment 1

Waterbodies and Impairments Addressed in the South Branch Potomac River and Shenandoah River Watershed TMDLs

TMDL Watershed	Stream Name	NHD Code	Trout	DO	Fe	FC
UNT/South Branch RM 21.86/Potomac River	UNT/UNT RM 1.38/UNT RM 0.30/South Branch Potomac River RM 21.86	WV-PSB-16-A-1				X
Buffalo Creek	Buffalo Creek	WV-PSB-30				X
Dumpling Run	Dumpling Run	WV-PSB-35-B			M	X
Anderson Run	Anderson Run	WV-PSB-62			M	X
Anderson Run	Mudlick Run	WV-PSB-62-C			X	X
Anderson Run	UNT/Mudlick Branch RM 4.62	WV-PSB-62-C-12			M	
Anderson Run	UNT/Mudlick Run RM 5.61	WV-PSB-62-C-15			M	
Anderson Run	UNT/Mudlick Run RM 5.63	WV-PSB-62-C-16			M	
Anderson Run	UNT/Mudlick Run RM 2.88	WV-PSB-62-C-3			M	X
Anderson Run	UNT/UNT RM 1.62/Mudlick Run RM 2.88	WV-PSB-62-C-3-B				X
Anderson Run	Turnmill Run	WV-PSB-62-C-4			X	X
Anderson Run	UNT/Mudlick Run RM 3.62	WV-PSB-62-C-6			M	
Anderson Run	UNT/Anderson Run RM 3.30	WV-PSB-62-I			M	
Anderson Run	Walnut Bottom Run	WV-PSB-62-J			M	X
UNT/South Branch Potomac River RM 40.44	UNT/South Branch Potomac River RM 40.44	WV-PSB-79-DL				X
UNT/South Branch Potomac River RM 40.44	UNT/UNT RM 0.07/South Branch Potomac River RM 40.44	WV-PSB-79-DL-1			M	
UNT/South Branch Potomac River RM 59.19	UNT/South Branch Potomac River RM 59.19	WV-PSB-82			M	X
UNT/South Branch Potomac River RM 59.19	UNT/UNT RM 1.61/South Branch Potomac River RM 59.19	WV-PSB-82-C			M	
UNT/South Branch Potomac River RM 59.19	UNT/UNT RM 2.27/South Branch Potomac River RM 59.19	WV-PSB-82-E			M	X
UNT/South Branch Potomac River RM 59.19	UNT/UNT RM 4.07/South Branch Potomac River RM 59.19	WV-PSB-82-F				X
Mill Creek	Mill Creek	WV-PSB-97				X
Mill Creek	Johnson Run	WV-PSB-97-B			M	X
Mill Creek	UNT/Johnson Run RM 1.12	WV-PSB-97-B-2			M	
Mill Creek	North Mill Creek	WV-PSB-97-E			M	X

Mill Creek	Brushy Run	WV-PSB-97-E-47			X	X
Mill Creek	UNT/Brushy Run RM 2.99	WV-PSB-97-E-47-G			M	
Mill Creek	Stony Creek	WV-PSB-97-E-48			X	X
Mill Creek	South Mill Creek	WV-PSB-97-F				X
Mill Creek	UNT/South Mill Creek RM 0.24	WV-PSB-97-F-1			M	
Mill Creek	Kessner Run	WV-PSB-97-F-42			M	
Robinson Run	Robinson Run	WV-PSB-98-G			M	X
Robinson Run	UNT/Robinson Run RM 2.84	WV-PSB-98-G-4		X	M	X
South Fork/Lunice Creek	South Fork/Lunice Creek	WV-PSB-98-T	X	X	X	X
South Fork/Lunice Creek	Big Star Run	WV-PSB-98-T-11	X			X
South Fork/Lunice Creek	UNT/South Fork RM 0.93/Lunice Creek	WV-PSB-98-T-2			M	
South Fork/Lunice Creek	UNT/South Fork RM 1.75/Lunice Creek	WV-PSB-98-T-3			M	
Powers Hollow	Powers Hollow	WV-PSB-105-B				X
Powers Hollow	Jordan Run	WV-PSB-105-J				X
Powers Hollow	Laurel Run	WV-PSB-105-J-10	X			X
Deer Run	Deer Run	WV-PSB-139			M	X
Deer Run	UNT/Deer Run RM 5.68	WV-PSB-139-F			M	
Capon Run	UNT/Capon Run RM 4.49	WV-PSN-201-P			X	X
Crab Run	Crab Run	WV-PSN-207			X	X
Crab Run	UNT/Crab Run RM 3.92	WV-PSN-207-M			M	
Crab Run	UNT/Crab Run RM 3.97	WV-PSN-207-N			X	X
Crab Run	UNT/Crab Run RM 5.65	WV-PSN-207-T			X	X

Note: RM – river mile
UNT – unnamed tributary
DO – Dissolved Oxygen
Trout – Trout Stream
Fe – iron impairment
FC – fecal coliform bacteria impairment
M – Impairment determined via modeling