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

Richard Eskin, Ph.D., Director
Technical and Regulatory Service Administration
Maryland Department of the Environment
1800 Washington Blvd., Suite 540
Baltimore, Maryland 21230-1718

SEP 29 2011

Dear Dr. Eskin:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the *Total Maximum Daily Load (TMDL) of Sediment in the Rock Creek Watershed, Montgomery County, Maryland.* The TMDL report was submitted by the Maryland Department of the Environment to EPA for final review on September 30, 2010. Based on EPA's review, a revised TMDL report was submitted on September 15, 2011. The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Maryland's Section 303(d) List.

The Rock Creek Watershed (MD-02140206) has been identified on Maryland's Section 303(d) list as impaired by nutrients--phosphorus (1996), (Needwood Lake (1998), and Lake Bernard Frank 1998)); sediments (1996), bacteria (2002), and impacts to biological communities (2002). A TMDL for bacteria was approved by the EPA in 2007. The Water Quality Analysis for eutrophication to address the Needwood Lake and Lake Bernard Frank nutrients/phosphorus listing was approved by the EPA in 2003. A phosphorus TMDL to address the Maryland 8-digit watershed nutrients/phosphorus listing is scheduled to be submitted to EPA in 2011. In the 2012 Integrated Report, the listing for impacts to biological communities will include the results of a stressor identification analysis. This TMDL addresses the 1996 sediments listing only.

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 the 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 uncertainties in the relationship between pollutant loads and instream water quality); and (7) be subject to public participation. In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. The enclosure to this letter describes how the sediment TMDLs for the Rock Creek Watershed satisfy each of these requirements.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocation pursuant to 40 CFR §122.44 (d)(1)(vii)(B). Please submit all such permits to EPA for review as per EPA's letter dated October 1, 1998.

If you have any questions or comments concerning this letter, please do not hesitate to contact María García, at 215-814-3199.

Sincerely,

Signed

Jon M. Capacasa, Director
Water Protection Division

Enclosure

cc: Lee Currey, MDE-TARSA
Melissa Chatham, MDE-TARSA

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

Decision Rationale
Total Maximum Daily Loads of Sediment in the Rock Creek Watershed Montgomery County, Maryland

Signed

Jon M. Capacasa, Director
Water Protection Division

Date: 9/21/2011

Decision Rationale
Total Maximum Daily Load of
Sediment in the Rock Creek Watershed
Montgomery County, Maryland

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by the State where technology based and other controls will not provide for attainment of water quality standards. A TMDL is a determination of the amount of a pollutant from point, nonpoint, and natural background sources, including a Margin of Safety (MOS), that may be discharged to a water quality limited waterbody.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDL for sediment in the Rock Creek watershed. The TMDL was established to address impairments of water quality, caused by sediment, as identified in Maryland's 1996 Section 303(d) List for water quality limited segments. The Maryland Department of the Environment (MDE) submitted the report, *Total Maximum Daily Load of Sediment in the Rock Creek Watershed, Montgomery County, Maryland,* dated September 2010, to EPA for final review on September 30, 2010. Based on EPA's review, a revised TMDL report was submitted on September 15, 2011. The TMDL in this report addresses the sediment impairment in the Rock Creek watershed as identified on Maryland's Section 303(d) List. The basin identification for the Rock Creek watershed is MD-02140206.

EPA's rationale is based on the TMDL Report and information in the computer files provided to EPA by MDE. EPA's review determined that the TMDL meets the following seven regulatory requirements pursuant to 40 CFR Part 130.

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

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

II. Summary

The TMDL specifically allocates the allowable sediment loading to the Rock Creek watershed. There are 38 permitted point sources which are included in the WLA. The fact that

the TMDL does not assign WLAs to any other sources in the watershed should not be construed as a determination by either EPA or MDE that there are no additional sources in the watershed that are subject to the National Pollutant Discharge Elimination System (NPDES) program. In addition, the fact that EPA is approving this TMDL does not mean that EPA has determined whether some of the sources discussed in the TMDL, under appropriate conditions, might be subject to the NPDES program. The sediment TMDL is presented as an average annual load in tons per year because it was calculated so as to not cause any sediment related impacts to aquatic health. The long term daily sediment TMDL is presented in tons per day. The calculation of the maximum daily TMDLs is explained in Appendix C of the TMDL report. The average annual Rock Creek watershed TMDL is summarized in Table 1. The TMDL is the sum of the LAs, NPDES Stormwater WLA, Process Water WLA, and MOS. The LAs include nonpoint source loads generated within the Rock Creek watershed. The maximum daily TMDL is presented in Table 2. Individual annual and daily WLAs for permitted point sources are provided in Table 3.

Table 1. Rock Creek Watershed Average Annual TMDL of Sediment/TSS (ton/yr)

TMDL (ton/day)		LA		WLA			MOS
				NPDES Stormwater WLA	+	Process Water WLA	
10,705.8	=	2,336.0	+	8,186.1		183.6	Implicit
				8,369.7			

Table 2. Rock Creek Watershed Maximum Daily Loads of Sediment/TSS (ton/day)

MDL (ton/day)		LA		WLA			MOS
				NPDES Stormwater WLA	+	Process Water WLA	
422.0	=	93.4	+	327.4		1.1	Implicit
				328.5			

Table 3. Wasteload Allocations for Process Water Point Sources in the Rock Creek Watershed

Facility	NPDES ID Number	WLA (ton/year)	MDL (ton/day)
WSSC – Bi-County Water Main Package Wastewater Treatment Plant	MD0069892	168.7	1.0
Montgomery County Phase I MS4	MD0068314	5,345.0	213.8
Phase II Jurisdictional MS4	MDR05550	508.3	20.3
State Highway Administration MS4	MD0068276	540.0	21.6
Other NPDES Regulated Stormwater[1]	--	1,792.8	71.7
Minor Facilities:[1]			
WMata-Red Line Pumping Station	MD0069035	14.9	0.06
Laurel Sand & Gravel-Southlawn Ready Mix	MD0069825		
Rockville Fuel & Feed Company	MDG492709		

[1] The "Other NPDES Regulated Stormwater" WLA includes sediment loadings from Urban Barren land use, which represents the permitted construction site WLA within the watershed.

Table 4. Other MDE NPDES Regulated Stormwater Permitted Point Sources Rock Creek Watershed

Permit Number	Facility	NPDES Group
02SW1239	Rockville Fuel and Feed Company	Phase I
02SW1072	McCormick Paint Works Company- Rockville	Phase I
02SW0337	M-NCPPC – Rock Creek Regional Park Maintenance Yard	Phase I
02SW1208	M-NCPPC – Pope Farm Nursery	Phase I
02SW0335	M-NCPPC – Meadowbrook Maintenance Yard	Phase I
02SW0334	M-NCPPC – Shady Grove Maintenance Yard	Phase I
02SW1172	Wilcoxon Construction, Inc.	Phase I
02SW1233	Georgetown Paper Stock of Rockville, Inc.	Phase I
02SW1415	Francis O. Day Company, Inc. – Southlawn Ln.	Phase I
02SW0668	Montgomery Scrap Corporation	Phase I
02SW1409	Federal Express-Rockville	Phase I
02SW0495	SP Recycling Corporation	Phase I
02SW0262	Montgomery County Solid Waste Transfer Station	Phase I
02SW0263	8309 Tujunga Avenue Corporation-Gude	Phase I
02SW0277	Montgomery County - Gaithersburg Depot	Phase I
02SW0278	Montgomery County - Silver Spring Depot	Phase I
02SW1075	Interstate Brands Corp. - Rockville	Phase I
02SW0694	U.S. Army - Walter Reed Army Medical Center - Forest Glenn Annex	Phase I
02SW0905	Rockville GM Used Auto Parts	Phase I
02SW1739	WSSC – Lyttonsville Garage	Phase I
02SW1245	Salvage Systems, Inc.	Phase I
02SW1382	Brookville Automotives, Inc.	Phase I
02SW0013	City of Rockville Maintenance Yard	Phase I
02SW1237	Maryland Cast Stone, Inc.	Phase I
02SW0327	WMata - Shady Grove Metrorail Yard	Phase I
02SW1323	SHA – Kensington Shop	Phase I
02SW1348	Two Brothers	Phase I
02SW0523	Montgomery County Schools – Shady Grove	Phase I
02SW1104	United States Postal Service – Suburban VMF	Phase I
02SW1118	Rob- Dee Auto Recyclers, LLC	Phase I
MS4-MO-02	City of Rockville MS4	Phase I

The TMDL is a written plan established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. The option is always available to refine the TMDL for resubmittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

III. Background

Rock Creek is a free flowing stream that originates near the town of Olney in Montgomery County, Maryland, and flows 23 miles in a southeasterly direction until it empties

into the tidal Potomac River in Washington, DC. The watershed is located in the Middle Potomac River sub-basin of the Chesapeake Bay watershed within both Montgomery County, Maryland, and Washington, DC. The entire watershed comprises 52,761 acres, of which 39,267 acres are located within Montgomery County, Maryland.

The North Branch of Rock Creek originates at Mount Zion, Maryland, and discharges into the Rock Creek mainstem in Rockville, Maryland. There are two impoundments located in the watershed: Needwood Lake and Lake Bernard Frank. There are no "high quality," or Tier II, stream segments (Benthic Index of Biotic Integrity (BIBI) and Fish Index of Biotic Integrity (FIBI) aquatic life assessment scores greater than 4 (scale 1-5)) located within the watershed requiring the implementation of Maryland's antidegradation policy. Also, approximately 0.2 percent of the watershed area is covered by water (i.e., streams, ponds, etc.). The total population in the Rock Creek watershed is approximately 307,000. The Rock Creek watershed consists primarily of urban land use (79.8%), and forest land use (15.7%). There are also small amounts of crop (3.4%) and pasture (1.0%).

The Rock Creek Watershed (MD-02140206) has been identified on Maryland's Section 303(d) list as impaired by nutrients--phosphorus (1996); (Needwood Lake (1998), and Lake Bernard Frank (1998)); sediments (1996); bacteria (2002); and impacts to biological communities (2002). A TMDL for bacteria was approved by the EPA in 2007. The Water Quality Analysis (WQA) for eutrophication to address the Needwood Lake and Lake Bernard Frank nutrients/phosphorus listing was approved by the EPA in 2003. A phosphorus TMDL to address the Maryland 8-digit watershed nutrients/phosphorus listing is scheduled to be submitted to EPA in 2011. In the 2012 Integrated Report, the listing for impacts to biological communities will include the results of a stressor identification analysis. This TMDL addresses the 1996 sediments listing only.

The designated use of the Rock Creek mainstem and its tributaries is Use I (Water Contact Recreation and of Nontidal Warmwater Aquatic Life), except for: (1) the Rock Creek mainstem and its tributaries, and the North Branch Rock Creek and its tributaries above Muncaster Mill Road, which are designated as Use III (Nontidal Cold Water); and (2) the Rock Creek mainstem and its tributaries between Route 28 and Muncaster Mill Road, which are designated as Use IV (Recreational Trout Waters)(COMAR 2009a,b,c,d,e,f,g).

The objective of the TMDL is to ensure that there will be no sediment impacts affecting aquatic health, thereby establishing a sediment load that supports the Use I/III/IV designations for the Rock Creek watershed. Currently, in Maryland there are not specific numeric criteria that quantify the impact of sediment on the aquatic life of nontidal stream systems. Therefore, to determine whether aquatic life is impacted by elevated sediment loads, MDE's Biological Stressor Identification (BSID) methodology was applied.

The BSID identifies the most probable cause(s) of observed biological impairments throughout Maryland 8-digit watersheds by ranking the likely stressors affecting a watershed using a suite of physical, chemical, and land use data. The results of the BSID analysis for the Rock Creek watershed determined that the biological communities are likely impaired due to flow/sediment related stressors. The degradation of biological communities in the watershed is

strongly associated with urban land use and its concomitant effects. Therefore, since sediment is identified as a stressor to the biological communities in the Rock Creek watershed, a TMDL is required.

CWA Section 303(d) and its implementing regulations require that TMDLs be developed for waterbodies identified as impaired by the State where technology based and other required controls do not provide for attainment of water quality standards. The sediment TMDL submitted by MDE is designed to allow for the attainment of the designated uses and to ensure that there will be no sediment impacts affecting aquatic health in the Maryland 8-digit Rock Creek watershed. Refer to Tables 1 and 2 above for a summary of allowable loads.

For this TMDL analysis, a total of eighteen water quality monitoring stations were used to characterize the Rock Creek watershed. All eighteen stations were biological/physical habitat monitoring stations from Maryland Biological Stream Survey (MBSS) program round one and round two data collection. The BSID analysis used the nine biological/physical habitat monitoring stations from the MBSS program round two data collection collected in 2003 and 2004.

The computational framework chosen was the Chesapeake Bay Program Phase 5.2 (CBP P5.2) watershed model target *edge-of-field* (EOF) land use sediment rate calculations combined with *sediment delivery ratio*. The *edge-of-stream* (EOS) sediment load is calculated per land use as a product of the land use area, land use target loading rate, and loss from the EOF to the main channel. The spatial domain of the CBP P5.2 watershed model segmentation aggregates to the Maryland 8-digit watershed, which is consistent with the impairment listing. The Rock Creek watershed was evaluated using one watershed TMDL segment consisting of two CBP P5.2 segments.

The nonpoint source and NPDES stormwater baseline sediment loads generated within the Rock Creek watershed are calculated as the sum of corresponding land use EOS loads within the watershed and represent a long-term average loading rate. Individual land use EOS loads are calculated as the product of the land use area, land use target loading rate, and loss from the EOF to the main channel. The loss from the EOF to the main channel is the *sediment delivery ratio* and is defined as the ratio of the sediment load reaching a basin outlet to the total erosion within the basin. A *sediment delivery ratio* is estimated from each land use type based on the proximity of the land use to the main channel. Thus, as the distance to the main channel increases, more sediment is stored within the watershed (i.e., *sediment delivery ratio* increases).

In order to quantify the impact of sediment on the aquatic health of the Rock Creek watershed, a reference watershed approach was used and resulted in the establishment of a sediment loading threshold for watershed within the Highland and Piedmont physiographic regions. Nine reference watersheds were selected from the Highland/Piedmont region. To reduce the variability when comparing watersheds within and across regions, the watershed sediment loads are normalized by a constant background condition, the all forested watershed condition. The new normalized load, defined as the *forest normalized sediment load* represents how many times greater the current watershed sediment load is than the all *forested sediment load.* The *forest normalized sediment load* is calculated as the current watershed sediment load

divided by the *all forested sediment load.* The reference watershed *forest normalized sediment load* was calculated as 3.3 and 4.2 for the median and 75th percentile, respectively. The 3.3 median value was selected as the *sediment loading threshold* to develop the TMDL as an environmentally conservative approach. The forest *normalized sediment load* for the Rock Creek watershed (estimated as 4.6) was calculated using CBP P5.2 land use, to best represent current conditions. A comparison of the Rock Creek watershed *forest normalized sediment load* to the *forest normalized reference sediment load* (also referred to as the *sediment loading threshold*) demonstrates that the watershed exceeds the *sediment loading threshold*, indicating that it is receiving loads that are above the maximum allowable load that it can sustain and still meet water quality standards. The allowable load for the impaired watershed is calculated as the product of the *sediment loading threshold* (determined from watersheds with healthy biological community) and the Rock Creek *all forested sediment load.*

The current total sediment load from the Rock Creek watershed is 15,526.3 tons per year. An overall reduction of 31.0 percent from current estimated loads was required to meet the TMDL allocation and Maryland's water quality standards. The sediment TMDL for the Rock Creek watershed was calculated to be 10,705.8 tons per year. The TMDL is subdivided into a nonpoint source load (2,336.0 tons per year) and two types of point source loads: NPDES regulated stormwater load (8,186.1 tons per year) and regulated process water load (183.6 tons per year). Section 4.0 of the TMDL Report provides a thorough description of the CBP P5 model and calculations.

IV. Discussion of Regulatory Conditions

EPA finds that MDE has provided sufficient information to meet all seven of the basic requirements for establishing a sediment TMDL for the Rock Creek watershed. EPA, therefore, approves this sediment TMDL for the Rock Creek watershed. This approval is outlined below according to the seven regulatory requirements.

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

Water Quality Standards consist of three components: designated and existing uses; narrative and/or numerical water quality criteria necessary to support those uses; and an anti-degradation Statement. The designated use of the Rock Creek mainstem and its tributaries is Use I (Water Contact Recreation and of Nontidal Warm Water Aquatic Life), except for: (1) the Rock Creek mainstem and its tributaries, and the North Branch Rock Creek and its tributaries above Muncaster Mill Road, which are designated as Use III (Nontidal Cold Water), and; (2) the Rock Creek mainstem and its tributaries between Route 28 and Muncaster Mill Road, which are designated as Use IV (Recreational Trout Waters)(COMAR 2009a,b,c,d,e,f,g). A TMDL for bacteria was approved by the EPA in 2007.

Maryland does not currently have numeric criteria for sediments. Therefore, to determine whether aquatic life is impacted by elevated sediment loads, MDE's BSID methodology was applied. The results of the BSID analysis for the Rock Creek watershed determined that the biological communities are likely impaired due to flow/sediment related stressors. The degradation of biological communities in the watershed is strongly associated with urban land

use and its concomitant effects.

Reductions in sediment loads are expected to result from decreased watershed and streambed erosion, which will then lead to improved benthic and fish habitat conditions. Specifically, sediment load reductions are expected to result in an increase in the number of benthic sensitive species present, an increase in the available and suitable habitat for a benthic community, a possible decrease in fine sediment (fines), and improved stream habitat diversity, all of which will result in improved water quality.

The sediment TMDL, however, will not completely resolve the impairment to biological communities within the watershed. Since the BSID watershed analysis identifies other possible stressors (i.e. total phosphorus) as impacting the biological conditions, this impairment remains to be fully addressed through the Integrated Report listing process and the TMDL development process, such that all impairing substances identified as impacting biological communities in the watershed are reduced to levels that will meet water quality standards, as established in future TMDLs for those substances.

The objective of this TMDL is to ensure that there will be no sediment impacts affecting aquatic health, thereby establishing a sediment load that supports the Use I/III/IV designations for the Rock Creek watershed. EPA believes this is a reasonable and appropriate water quality goal.

2) The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.

Total Allowable Load

EPA regulations at 40 CFR §130.2(i) state *that the total allowable load shall be the sum of individual WLAs for point sources, LAs for nonpoint sources, and natural background concentrations*. The TMDL for sediment for the Rock Creek watershed is consistent with 40 CFR §130.2(i) because the total loads provided by MDE equal the sum of the individual WLAs for point sources and the land based LAs for nonpoint sources.

The allowable load for the Rock Creek watershed was calculated as the product of the *sediment loading threshold* (3.3, determined from healthy biological community) and the Rock Creek watershed *all forested sediment loads*. The sediment TMDL for the Rock Creek watershed was calculated to be 10,705.8ton/yr. This load is considered the maximum allowable load the watershed can sustain and support aquatic life.

In order to attain the TMDL loading cap, reductions were applied to the predominant controllable sediment sources. Urban land was identified as the only predominant controllable source in the watershed at 83.8 percent of the total watershed sediment load. Thus, reductions were only applied to this source. Additionally, all urban land in the Rock Creek watershed is considered to represent regulated stormwater sources (i.e., all urban stormwater is regulated via a permit). The TMDL results in an overall reduction of 31.0 percent for the Rock Creek watershed.

The sediment TMDL and allocations are presented as mass loading rates of tons per year for the average annual load and tons per day for the long term daily load. Expressing TMDLs as annual and daily mass loading rates is consistent with Federal regulations at 40 CFR §130.2(i), which states that TMDLs can be expressed in terms of either mass per time, toxicity, or other appropriate measure. The average annual and long term daily sediment TMDLs are presented in Tables 1 and 2, respectively.

Load Allocations

According to Federal regulations at 40 CFR §130.2(g), LAs are best estimates of the loading, which may range from reasonably accurate estimates to gross allotments, depending on the availability of data and appropriate techniques for predicting the loading. Wherever possible, natural and nonpoint source loadings should be distinguished. The TMDL summary in Table 1 contains the LA for the Rock Creek watershed.

The nonpoint source sediment loads generated within the Rock Creek watershed are calculated as the sum of corresponding land use EOS loads within the watershed and represent a long-term average loading rate. Urban land was identified as the only predominant controllable source in the watershed. Thus, reductions were only applied to this source(s) indicated, and nonpoint source reductions were not required to achieve this TMDL.

Wasteload Allocations

There are 38 permitted point sources in this watershed and the permits can be grouped into two categories, process water and stormwater. There are four process water permits and thirty-four NPDES Phase I or Phase II stormwater permits. The WLAs for these four process water permits are calculated based on their Total Suspended Sediments (TSS) limits (average monthly or weekly concentration values) and corresponding flow. The process water permits are further divided into minor and major facilities, based on whether their design flow is greater or less than 1.0 Millions of Gallons per Day (MGD). The total estimated TSS load from all of the process sources is based on current permit limits and is equal to 183.6 ton/yr. No reductions were applied to this source, since such controls would produce no discernable water quality benefit when nonpoint sources and regulated stormwater sources comprise greater than 98.8 percent of the total watershed sediment load.

The stormwater permits identified throughout the Rock Creek watershed are regulated based on Best Management Practices (BMPs) and do not include TSS limits. In the absence of TSS limits, the NPDES regulated stormwater load is calculated using CBP P5.2 urban sediment EOF target values. The Rock Creek NPDES stormwater WLA is based on reductions applied to the sediment load from the urban land use in the watershed and may include legacy or other sediment sources. Some of these sources may also be subject to controls from other management programs. The Rock Creek NPDES stormwater WLA requires an overall reduction of 37.1 percent.

See Tables 3 through 4 above for a list of facilities that have been assigned WLAs.

Federal regulations at 40 CFR §122.44(d)(1)(vii)(B) require that, for an NPDES permit for an individual point source, the effluent limitations must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. There is no express or implied statutory requirement that effluent limitations in NPDES permits necessarily be expressed in daily terms. The CWA definition of "effluent limitation" is quite broad (effluent limitation is "any restriction on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources ...)." See CWA 502(11). Unlike the CWA's definition of TMDL, the CWA definition of "effluent limitation" does not contain a "daily" temporal restriction. NPDES permit regulations do not require that effluent limits in permits be expressed as maximum daily limits or even as numeric limitations in all circumstances, and such discretion exists regardless of the time increment chosen to express the TMDL. For further guidance, refer to Benjamin H. Grumbles memo (November 15, 2006) titled *Establishing TMDL Daily Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 (April 25, 2006) and implications for NPDES Permits.*

EPA has authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. It is expected that MDE will require periodic monitoring of the point source(s), through the NPDES permit process, in order to monitor and determine compliance with the TMDL's WLAs. Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR Part 130.

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

The TMDLs consider the impact of background pollutants by considering the sediment load from natural sources such as forested land. The CBP P5.2 model also considers background pollutant contributions by incorporating all land uses.

4) The TMDLs consider critical environmental conditions.

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to account for critical conditions for stream flow, loading, and water quality parameters. The intent of the regulations is to ensure that: (1) the TMDLs are protective of human health, and (2) the water quality of the waterbodies is protected during the times when they are 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[1]. Critical conditions are a combination of environmental factors (e.g., flow, temperature, etc.), which have an acceptably low frequency of occurrence. In specifying critical conditions in the waterbody, an attempt is made to use a reasonable worst-case scenario condition.

The biological monitoring data used to determine the reference watersheds reflect the impacts of stressors (i.e., sediment impacts to stream biota) over the course of time; and,

[1] EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

therefore, depict an average stream condition (i.e., captures all high and low flow events). Since the TMDL endpoint is based on the median of forest normalized loads from watersheds assessed as having good biological conditions (i.e., passing Maryland's biocriteria), by the nature of the biological data described above, it must inherently include the critical conditions of the reference watersheds. Therefore, since the TMDL reduces the watershed sediment load to a level compatible with that of the reference watersheds, critical conditions are inherently addressed.

5) The TMDLs consider seasonal environmental variations.

In the Rock Creek watershed sediment TMDL, seasonality is captured in two components. First, it is implicitly included through the use of the biological monitoring data as biological communities reflect the impact of stressors over time, as described above. Second, the MBSS dataset included benthic sampling in the spring (March 1 - April 30) and fish sampling in the summer (June 1 - September 30). Benthic sampling in the spring allows for the most accurate assessment of the benthic population, and therefore provides an excellent means of assessing the anthropogenic effects of sediment impacts on the benthic community. Fish sampling is conducted in the summer when low flow conditions significantly limit the physical habitat of the fish community; and it is, therefore, most reflective of the effects of anthropogenic stressors as well.

6) The TMDLs include a Margin of Safety.

The requirement for a MOS is intended to add a level of conservatism to the modeling process in order to account for uncertainty. Based on EPA guidance, the MOS can be achieved through two approaches. One approach is to reserve a portion of the loading capacity as a separate term, and the other approach is to incorporate the MOS as part of the design conditions. MDE has adopted an implicit MOS for this TMDL. It is proposed that the estimated variability around the reference watershed group used in this analysis already accounts for such uncertainty. Analysis of the reference group *forest normalized sediment loads* indicates that approximately 75 percent of the reference watersheds have a value of less than 4.2. Also, 50 percent of the reference watersheds have a value less than 3.3. Based on this analysis the *forest normalized reference sediment load* (also referred to as the *sediment loading threshold*) was set at the median value of 3.3. This is considered an environmentally conservative estimate, since 50 percent of the reference watersheds have a load above this value (3.3), which when compared to the 75 percent value (4.2), results in an implicit MOS of approximately 18 percent.

7) The TMDLs have been subject to public participation.

MDE provided an opportunity for public review and comment on the sediment TMDL for the Rock Creek watershed. The public review and comment period was open from August 19, 2010 through September 17, 2010. MDE received one set of written comments. The comments were considered and addressed appropriately.

A letter was sent to the U.S. Fish and Wildlife Service pursuant to Section 7(c) of the Endangered Species Act, requesting the Service's concurrence with EPA's findings that approval of this TMDL does not adversely affect any listed endangered and threatened species, and their

critical habitats.

V. Discussion of Reasonable Assurance

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. WLAs will be implemented through the NPDES permit process. According to 40 CFR §122.44(d)(1)(vii)(B), the effluent limitations for an NPDES permit must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. Furthermore, EPA has the authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for that point source.

Maryland has several well established programs to draw upon including the Water Quality Improvement Act of 1998 (WQIA) and the Federal Nonpoint Source Management Program (§319 of the Clean Water Act). Potential funding sources available for local governments for implementation include the State Water Quality Revolving Loan Fund and the Stormwater Pollution Cost Share Program.

Nonpoint source controls to achieve LAs will be implemented in an iterative process that places priority on those sources having the largest impact on water quality, with consideration given to ease of implementation and cost. Potential BMPs for reducing sediment loads and resulting impacts can be grouped into two general categories. The first is directed toward agricultural lands and the second is directed toward urban (developed) lands.

Since urban land was identified as the only predominant controllable source of sediment within the watershed (i.e., 83.8 percent of the total Rock Creek Baseline Sediment Load), the entirety of the required sediment reductions within the Rock Creek watershed are attributed to urban (developed) land use. The BMPs applicable to reducing urban sediment loads are discussed in detail in Section 5 of the TMDL report. Implementation is expected to occur primarily via the Phase I MS4 permitting process for medium and large municipalities, specifically, in this watershed, the current Montgomery County Phase I MS4 permit, which requires the jurisdiction to retrofit 20 percent of its existing impervious area within a permit cycle, or five years, and develop an implementation plan to meet its assigned regulated stormwater.

For the implementation of the WLA stormwater component, MDE estimates that future stormwater retrofits will have a 65 percent reduction efficiency for TSS, which is subject to change over time. Additionally, any new development in the watershed will be subject to the Stormwater Management Act of 2007, and will be required to use environmental site design to the maximum extent practicable.

In summary, through the use of the aforementioned funding mechanisms and BMPs, there is reasonable assurance that this TMDL can be implemented.