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

Ellen Gilinsky, Ph.D., Director
Division of Water Quality Programs
Virginia Department of Environmental Quality
629 E. Main Street
P.O. Box 1105
Richmond, Virginia 23218

NOV 1 0 2010

Dear Dr. Gilinsky:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve the Total Maximum Daily Loads (TMDLs) to address the recreation use (bacteria) impairments in Hunting Creek, Cameron Run, and Holmes Run Watersheds, located in the City of Alexandria and Fairfax County, Virginia. The TMDL Report was submitted to EPA for review on September 28, 2010. The TMDL was established and submitted in accordance with Sections 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Virginia's Section 303(d) List.

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. The bacteria TMDLs for Hunting Creek, Cameron Run, and Holmes Run, satisfy each of these requirements. In addition, the TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met. A copy of EPA's Rationale for approval of these TMDLs is included with this letter.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocations 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 September 29, 1998.

If you have any questions please call me, or contact Greg Voigt, Virginia TMDL coordinator, at 215-814-5737.

Sincerely,

Jon M. Capacasa, Director
Water Protection Division

Enclosure

cc: David Lazarus, VADEQ

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

Decision Rationale
Total Maximum Daily Loads for Recreation Use (Bacteria) Impairments in Hunting Creek, Cameron Run and Holmes Run Watersheds
City of Alexandria and Fairfax County, Virginia

Jon M. Capacasa, Director
Water Protection Division

Date: 11.10.10

Decision Rationale
Recreation Use (Bacteria) Impairments in
Holmes Run, Cameron Run, and Hunting Creek Watersheds
City of Alexandria and Fairfax County, 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 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 will support the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for the primary recreation use (bacteria) impairments in Holmes Run, Cameron Run and Hunting Creek, Virginia. EPA's rationale is based on the determination that the TMDLs meet the following seven regulatory conditions 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, the TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

II. Background

Holmes Run, Cameron Run and Hunting Creek are located within the Potomac River Basin in Virginia (USGS segment 02070010). The impaired section of Holmes Run drains into the impaired section of Cameron Run, which in turn drains into the impaired section of the tidal Hunting Creek. The impaired stream segments begin at the outlet of Lake Barcroft and extend to the confluence of the Potomac River, covering an area of approximately 6.19 square miles. The entire watershed for Holmes Run, Cameron Run and Hunting Creek is highly developed. Approximately 12 percent of the watershed is made up of parks, golf courses, or open space. The rest of the watershed is comprised of developed land uses. The Virginia Department of Environmental Quality (VADEQ) placed Holmes Run, Cameron Run and Hunting Creek on the 2008 Section 303(d) List of Impaired Waters for failure to meet the primary recreation use. A complete listing history of the impaired stream segments covered under the Holmes Run, Cameron Run and Hunting Creek TMDLs is provided in Table 1.

Table 1. Section 305(b)/303(d) Listing History for the Hunting Creek, Cameron Run and Holmes Run Bacteria TMDLs

TMDL	Impairment	1998 303(d) ID	2002 303(d) ID	2004 303(d) ID	2006 303(d) ID	2008 303(d) ID	305(b) ID
Hunting Creek	Bacteria	VAN-A13E*	VAN-A13E	VAN-A13E-02	00306	A13R-03-BAC	VAN-A13E_HUT01A02
Holmes Run	Bacteria	not listed	not listed	VAN-A13R-02	00795	A13R-02-BAC	VAN-A13R_HOR01A00
Cameron Run	Bacteria	not listed	not listed	not listed	60029	A13R-03-BAC	VAN-A13R_CAM01A04

Virginia designates all of its waters for the primary contact recreation use; therefore, all waters are required to meet the bacteriological criteria for this use. The criterion applies to all flows. According to Section 9 VAC 25-260-170 of Virginia's Water Quality Standards, *E. coli* bacteria shall not exceed a geometric mean of 126 *E. coli* counts per 100 ml of water for four or more weekly samples within a calendar month. Therefore, the in-stream *E. coli* target for the Holmes Run, Cameron Run and Hunting Creek TMDL was a monthly geometric mean not exceeding 126 cfu/100 ml.

The USGS Hydrologic Simulation Program - Fortran (HSPF) water quality model was used to both simulate the fate and transport of bacteria for the non-tidal Holmes Run and Cameron Run and to provide nonpoint source (NPS) input loads for the tidal Hunting Creek. The HSPF model is a continuous simulation model that can account for NPS pollutants in runoff, as well as pollutants entering the flow channel from point sources. HSPF is the standard model used to develop bacteria TMDLs in Virginia's rivers and streams. The model is not capable, however, of simulating tidally-influenced waters. Therefore, the Euler-Lagrangian Circulation (ELCIRC) water quality model was selected to simulate the fate and transport of bacteria and the hydrodynamics of the tidal Hunting Creek. ELCIRC is a two dimensional continuous simulation model which can solve water equations on an orthogonal unstructured grid.

The TMDLs developed for Holmes Run, Cameron Run and Hunting Creek were based on the Virginia State Standard for *E. coli*. The models used in the development of the TMDLs were set up to estimate the bacteria loads in fecal coliform. The model output is converted to concentrations of *E. coli* using VADEQ's translator equation (presented in Section 1 of this Decision Rationale).

The HSPF and ERCIRC models were calibrated to simulate TMDL allocations for Holmes Run, Cameron Run and Hunting Creek. The development of a TMDL allocation is an iterative process that requires numerous runs until the distribution of simulated *E. coli* concentrations mirrors the distribution of observed *E. coli* concentrations. After TMDL allocations are simulated, a source reduction assessment compares the TMDL allocations against the State's water quality criteria to ensure that the allocations specified in the TMDLs attain water quality standards. Tables 2, 3, 4, 5, 6 and 7 summarize the daily and annual bacteria loads developed for the Holmes Run, Cameron Run and Hunting Creek TMDLs.

Table 2. Holmes Run TMDL (cfu/day) for *E. coli* Bacteria

WLA	LA	MOS	TMDL
2.56E+11	2.74E+10	Implicit	2.83E+11

Table 3. Holmes Run TMDL (cfu/year) for *E .coli* Bacteria

WLA	LA	MOS	TMDL
8.38E+13	8.99E+12	Implicit	9.28E+13

Table 4. Cameron Run TMDL (cfu/day) for *E. coli* Bacteria

WLA	LA	MOS	TMDL
4.40E+11	6.54E+10	Implicit	5.05E+11

Table 5. Cameron Run TMDL (cfu/year) for *E. coli* Bacteria

WLA	LA	MOS	TMDL
1.33E+14	1.98E+13	Implicit	1.53E+14

Table 6. Hunting Creek TMDL (cfu/day) for *E. coli* Bacteria

WLA	LA	MOS	TMDL
2.09E+12	1.90E+11	Implicit	2.28E+12

Table 7. Hunting Creek TMDL (cfu/day) for *E. coli* Bacteria

WLA	LA	MOS	TMDL
3.24E+14	2.23E+13	Implicit	3.46E+14

III. Discussion of Regulatory Conditions

EPA finds that Virginia has provided sufficient information to meet all of the seven basic requirements for establishing primary contact (bacteria) impairment TMDLs for Holmes Run, Cameron Run and Hunting Creek. Additionally, Virginia provided reasonable assurance that the bacteria TMDLs can be met. Therefore, EPA is approving the TMDLs. EPA's approval is outlined according to the regulatory requirements listed below.

1) The TMDL is designed to meet the applicable water quality standards.

As of the approval of the latest revisions to Virginia's Water Quality Standards (February 1, 2010), Virginia's bacteria water quality criteria states that *E. coli* bacteria shall not exceed a geometric mean of 126 *E. coli* counts per 100 ml of water for four or more weekly samples within a calendar month. If there are insufficient samples to calculate the calendar month geometric mean, no more than 10 percent of the total samples in an assessment period can exceed an *E. coli* concentration of 235 counts per 100 ml.

During the 2008 assessment period (January 2001 through December 2006) for Holmes Run, Cameron Run and Hunting Creek, twenty-five percent or more of the samples collected at monitoring stations in the watershed exceeded the *E. coli* assessment value of 235 cfu/100 ml: Three out of 12 *E. coli* samples (25%) collected at station, 1AHOR001.04, in Holmes Run; five out of 18 *E. coli* samples (27.8%) collected at station,1ACAM002.93, in Cameron Run; 11 out of

27 *E. coli* samples (40.7%) collected at station, 1AHUT000.01, in Hunting Creek; and three out of 11 *E. coli* samples (27.3%) collected at station, 1AHUT001.72, in Hunting Creek.

Section 303(d) of the Clean Water Act and EPA's Water Quality Planning and Management Regulations (40 CFR Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for waterbodies that do not meet water quality standards. In the impaired segments of Holmes Run, Cameron Run and Hunting Creek, TMDLs were developed through computer modeling based on data collected throughout the watershed. The purpose for developing the TMDLs is to reduce the current bacteria loadings under the existing conditions so that water quality standards can be meet.

The HSPF water quality model was selected as the modeling framework to simulate fecal coliform existing conditions and to perform fecal bacteria TMDL allocations for Holmes Run and Cameron Run. The HSPF model is a continuous simulation model that can account for nonpoint source pollutants in runoff, as well as pollutants entering the flow channel from point sources. In establishing the existing and allocation conditions, seasonal variations in hydrology, climatic conditions, and watershed activities can be explicitly accounted for in the model. Additionally, through the use of HSPF, seasonal aspects of precipitation patterns within the watershed are considered.

Since HSPF is not capable of simulating tidal waterbodies, the ELCIRC model was chosen to simulate the hydrodynamics and fate and transport of bacteria in tidal Hunting Creek. The version of ELCIRC used for the TMDL development in Hunting Creek is a two dimensional continuous simulation model developed to represent the hydrodynamics and water quality of tidal waters. ELCIRC operates using relatively small grid sizes and a relatively large time step. ELCIRC is also capable of representing the dynamics of wetting and drying in tidal flats which occur in Hunting Creek. Over the course of the ERCIRC model's simulation period, 2004 through 2005, seasonal variations and a variety of hydrological conditions, covering a range of potential critical conditions were explicitly incorporated within the model.

In the TMDL models, bacteria concentrations were modeled over the entire duration of a representative modeling period, and pollutant loads were adjusted until the *E. coli* standard was met. The development of the allocations was an iterative process that required numerous runs, followed by a source reduction assessment against the applicable water quality standard.

Both the HSPF model and the ELCIRC model simulate fecal coliform bacteria. VADEQ's translator equation was used to compare simulated fecal coliform bacteria concentrations to the *E. coli* criterion:

$$\log_2 EC\ (\text{cfu}/100\ \text{ml}) = -0.0172 + 0.91905 * \log_2 FC\ (\text{cfu}/100\ \text{ml})$$

Where:

EC = E. coli bacteria concentration
FC = Fecal coliform bacteria concentration

2) ***The TMDL includes a total allowable load as well as individual wasteload allocations and load allocations.***

Total Allowable Loads

The objective of the bacteria TMDLs is to determine what reductions in bacteria loadings from point and nonpoint sources are required to meet state water quality standards. TMDLs must consider all significant sources contributing bacteria to the impaired stream segments. The sources can be separated into nonpoint and point sources. The different sources in the TMDL are defined in the following equation:

TMDL = WLAs + LAs + MOS

Where:

WLA = wasteload allocation
LA = load allocation
MOS = margin of safety

Wasteload Allocations

EPA regulations require that an approvable TMDL include individual WLAs for each point source. According to 40 CFR §122.44(d)(1)(vii)(B), "Effluent limits developed to protect a narrative water quality criterion, a numeric water quality criterion, or both, are consistent with assumptions and requirements of any available WLA for the discharge, prepared by the state and approved by EPA, pursuant to 40 CFR §130.7." Furthermore, EPA has authority to object to the issuance of any National Pollutant Discharge Elimination System (NPDES) permit that is inconsistent with the WLAs established for that point source.

In the Holmes Run, Cameron Run and Hunting Creek TMDLs, there are seven Municipal Storm Sewer System (MS4s) permits and two individual VPDES permits (ASA's Advanced Wastewater Treatment Plant (WWTP) and COA's Combined Sewer System (CSS)) that are currently authorized to discharge bacteria into the watershed. Tables 8, 9, 10, 11 and 12 provide the WLAs developed for each permitted point source.

Potential TMDL model scenarios were run for a two-year simulation period, 2004-2005, to represent the level of reductions required from the permitted point sources in the Holmes Run, Cameron Run and Hunting Creek watershed. This period includes representative low and high flow conditions, but excludes the record low flow (2002) and high flow (2003) years of calibration. The following potential TMDL scenarios were assessed by determining the simulated rate of exceedance of the calendar month geometric mean criteria for *E. coli* bacteria.

- **ASA Advanced Wastewater Treatment Plant:** Under all potential TMDL scenarios, loads from ASA Advanced WWTP were set assuming a fecal coliform concentration of 195 cfu/100 ml, which is equivalent to the permitted *E. coli* concentration of 126 cfu/100 ml; and a daily flow of 66 MGD, which represents the plants design capacity of 54 MGD, with an additional 12 MGD allotted for the future expansion and growth of point sources within the watershed.

- **City of Alexandria's Combined Sewer System:** Under potential TMDL scenarios, reductions were made to CSS bacteria loads for outfalls 002, 003 and 004. Outfall 001 discharges to the Potomac River and is not given an allocation under this TMDL. Reductions in Combined Sewer Overflow (CSO) bacteria loads were simulated by keeping the simulated bacteria concentration at the outfall's baseline level, but proportionately reducing flows on each day an overflow occurs. In other words, a 50 percent reduction in CSO loads will be implemented by reducing flows by 50 percent for each overflow event.

- **Municipal Storm Drain Systems:** Allocations for MS4s were based on a land-use based approach where all land-based loadings, except for the loadings from open space and public land use categories, were allocated to the MS4s. One disadvantage to this approach is that it is not able to distinguish between urban areas that drain to MS4s and those that drain to pervious areas, allowing infiltration into subsurface flows; thus making the land-based approach a conservative method. Due to the spatial overlap between MS4 entities, the MS4 loads are aggregated by jurisdiction in the TMDLs.

Table 8. *E. coli* Wasteload Allocation for ASA Advanced WWTP

Permit Number	Permit Type	Design Flow (MGD)	Permit Concentration (cfu/100 ml)	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)
VA0025160	Municipal	54	126	2.58E+11	9.40E+13
Allocation for the Future Growth of Point Sources:				5.75E+10	2.10E+13
			Total:	3.15E+11	1.15E+14

Table 9. Wasteload Allocation for COA Combined Sewer System

Permit Number	Outfall	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%)
VA0087068	002	1.72E+11	6.26E+13	80%
	003	2.10E+09	7.68E+11	99%
	004	2.33E+09	8.52E+11	99%
	Total	1.76E+11	6.42E+13	86%

Table 10. *E. coli* Wasteload Allocation for MS4 Permits for Holmes Run

Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%)
VAR040057	City of Alexandria			
VAR040062	VDOT	6.58E+10	2.40E+13	83%
VA0088587	Fairfax County			
VAR040104	Fairfax County Public Schools			
VAR040062	VDOT	1.50E+11	5.47E+13	83%
VAR040065	City of Falls Church			
VAR040062	VDOT	1.40E+10	5.12E+12	83%

Table 11. *E. coli* Wasteload Allocation for MS4 Permits for Cameron Run

Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%)
VAR040057	City of Alexandria			
VAR040062	VDOT	8.77E+10	3.20E+13	83%
VA0088587	Fairfax County			
VAR040104	Fairfax County Public Schools			83%
VAR040062	VDOT	2.63E+11	9.60E+13	
VAR040065	City of Falls Church			
VAR040062	VDOT	1.40E+10	5.12E+12	83%

Table 12. *E. coli* Wasteload Allocation for MS4 Permits for Hunting Creek

Permit Number	MS4 Permit Holder	Wasteload Allocation (cfu/day)	Wasteload Allocation (cfu/year)	Percent Reduction (%)
VA0088579	Arlington County			
VAR040062	VDOT	1.01E+09	3.68E+11	98%
VAR040057	City of Alexandria			
VAR040062	VDOT			
VAR040111	George Washington Memorial Parkway	1.02E+11	3.73E+13	92%
VA0088587	Fairfax County			
VAR040104	Fairfax County Public Schools			
VAR040062	VDOT			
VAR040111	George Washington Memorial Parkway	2.79E+11	1.02E+14	83%
VAR040065	City of Falls Church			
VAR040062	VDOT	1.40E+10	5.12E+12	83%

<u>Load Allocations</u>

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 loading. Wherever possible, natural and NPS loads should be distinguished.

In the Holmes Run, Cameron Run and Hunting Creek TMDLs, load allocations were divided into land-based loadings from land uses (nonpoint sources, NPS) and directly applied loadings to the stream (*e.g.*, livestock, wildlife). Water quality standards are met in Holmes Run and Cameron Run when edge-of-stream loads are reduced by 83 percent and the direct deposition of wildlife is reduced by 50 percent. In tidal Hunting Creek, the reductions required to achieve water quality standards include: a 100 percent reduction in human sources, a 50 percent reduction in direct deposition by wildlife, and a 98 percent reduction in edge-of-stream loads. Tables 13, 14 and 15 represent the load allocations and the percent reductions from existing loads for Holmes Run, Cameron Run and Hunting Creek, respectively.

Table 13. Holmes Run *E. coli* Load Allocation

Load Allocation (cfu/year)	Percent Reduction (%)
8.99E+12	77%

Table 14. Cameron Run *E. coli* Load Allocation

Load Allocation (cfu/year)	Percent Reduction (%)
1.98E+13	76%

Table 15. Hunting Creek *E. coli* Load Allocation

Load Allocation (cfu/year)	Percent Reduction (%)
2.23E+13	78%

3) The TMDLs consider the impacts of background pollution.

Virginia considers background pollutant contributions in the TMDL development process by quantifying the fecal coliform loads from wildlife sources.

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 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 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. For example, stream analysis often uses a low flow (7Q10) design condition because the ability of the waterbody to assimilate pollutants without exhibiting adverse impacts is at a minimum.

Generally, in establishing the existing and allocation conditions for waterbodies, seasonal variations in hydrology, climatic conditions, and watershed activities are explicitly accounted for in the model. Frequently, both wet weather and dry weather conditions are identified as the critical condition. For example, under dry weather conditions, the direct deposition load from cattle may dominate. Under wet weather conditions, the nonpoint source loads from low-density residential and pasture areas may dominate. Since the Holmes Run, Cameron Run and Hunting Creek TMDLs were developed using a continuous simulation model, results will apply to both high and low flow conditions.

5) The TMDLs consider seasonal environmental variations.

Seasonal variations involve changes in stream flow and loadings as a result of hydrologic and climatological patterns. In the continental United States, seasonally high flows normally occur in early spring from snow melt and spring rain, while seasonally low flows typically occur during the warmer summer and early fall drought periods.

In establishing the existing and allocation conditions in the Holmes Run, Cameron Run and Hunting Creek TMDLs, seasonal variations in hydrology, climatic conditions, and watershed activities were explicitly accounted for in the modeling which incorporates the seasonal variations of rainfall, runoff, and fecal coliform wash-off by using an hourly time-step.

6) The TMDLs include a Margin of Safety.

This requirement is intended to add a level of safety to the modeling process to account for any uncertainty. The MOS may be implicit, built into the modeling process by using conservative modeling assumptions, or explicit, taken as a percentage of the WLA, LA, or TMDL.

The bacteria TMDLs for Holmes Run, Cameron Run, and Hunting Creek use an implicit MOS. The MOS was implicitly incorporated into these TMDLs by using conservative estimates for all known factors that would affect bacteria loadings in the watershed, consistent with the observed bacteria concentrations. These factors include animal populations and their bacteria production rates, as well as model parameters such as decay rates.

In tidal Hunting Creek, two additional conservative assumptions were made. First, the concentration of the source responsible for the largest volume of water entering tidal Hunting Creek, ASA WWTP, was set at the fecal coliform equivalent of its monthly *E. coli* permit limit, 126 cfu/100 ml, which is also the geometric mean water quality criterion. Second, TMDL scenarios for tidal Hunting Creek were developed based on the principal that the tidal drainage to Hunting Creek had to meet water quality standards without significant dilution from the Potomac River. Potential TMDL scenarios assumed that water quality standards were met by sources outside of Hunting Creek at their point of discharge. For all potential TMDL scenarios, the concentrations at the boundaries of the model domain in the Potomac River were held at the fecal coliform equivalent of the *E. coli* geometric mean standard of 126 cfu/100 ml. Additionally, TMDL scenarios set all sources within the model domain, but outside of the Hunting Creek watershed, at a constant fecal coliform concentration of 195 cfu/100 ml.

7) The TMDL has been subject to public participation.

Virginia generally seeks public participation at every stage of TMDL development in order to receive input from stakeholders and to apprise the stakeholders of the progress made. Virginia frequently conducts technical advisory committee meetings and always conducts two public meetings within the watershed. Table 16 represents the date, location and the number of people who attended the respective meetings. Following the public meetings, a thirty-day public comment period was held from July 19, 2010 to August 18, 2010. Five organizations provided comments during the public comment period.

Table 16. Public Participation for the Holmes Run, Cameron Run, and Hunting Creek TMDLs

Meeting	Date	Location	Attendance
TAC Meeting No. 1	March 10, 2009	Alexandria Beatley Central Library in Alexandria, Virginia.	17
TAC Meeting No. 2	June 30, 2009		16
TAC Meeting No. 3	June 25, 2010		14
Public Meeting No. 1	March 25, 2009	Dr. Oswald Durant Memorial Center in Alexandria, Virginia.	5
Public Meeting No. 2	June 30, 2010	Alexandria Beatley Central Library in Alexandria, Virginia.	12
Public Meeting No. 3	July 29, 2010		15

IV. Discussion of Reasonable Assurance

Virginia's 1997 Water Quality Monitoring, Information and Restoration Act (the "Act") directs the State Water Control Board to "develop and implement a plan to achieve fully supporting status for impaired waters" (Section 62.1-44.19.7). The Act also establishes that the implementation plan shall include the date of expected achievement of water quality objectives, measurable goals, corrective actions necessary and the associated costs, benefits, and environmental impacts of addressing the impairments.

For the Holmes Run, Cameron Run, and Hunting Creek TMDLs, 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 authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. When a TMDL is developed for waters impaired by both point and nonpoint sources, and the WLA is based on the assumption that nonpoint source load reductions will occur, EPA's guidance states that the TMDLs should provide reasonable assurances that nonpoint source control measures will achieve load reductions in order for the TMDLs to be approvable.

For the implementation of the WLA component of the TMDL, the Commonwealth intends to utilize the VPDES program, which typically includes consideration of the Water Quality Monitoring, Information, and Restoration Act requirements during the permitting process. Requirements of the permit process should not be duplicated in the TMDL process, and with the exception of stormwater related permits, permitted sources are not usually addressed during the development of a TMDL implementation plan.

Virginia's DEQ and Department of Conservation and Recreation (DCR) coordinate separate state permitting programs that regulate the management of pollutants carried by stormwater runoff. DEQ regulates stormwater discharges associated with industrial activities through its VPDES program, while DCR regulates stormwater discharges from construction sites, and from MS4s through the Virginia Stormwater Management Program. For MS4 permits, the Commonwealth expects the permittee to specifically address the TMDL wasteload allocations for stormwater through the iterative implementation of programmatic Best Management Practices (BMPs). BMP effectiveness would be determined through permittee implementation of an individual control strategy that includes a monitoring program that is sufficient to determine its BMP effectiveness.

Nonpoint source controls to achieve LAs can be implemented through a number of existing programs such as Section 319 of the CWA, commonly referred to as the Nonpoint Source Program. Additional funding sources for implementation include the U.S. Department of Agriculture's Conservation Reserve Enhancement and Environmental Quality Incentive Programs, the Virginia State Revolving Loan Program, and the Virginia Water Quality Improvement Fund.

In general, Virginia intends for the required reductions to be implemented in an iterative process that first addresses those sources with the largest impact on water quality. In both urban and rural areas, reducing the human bacteria loading from straight pipe discharges and failing septic systems will be a primary implementation focus because of their health implications. These components could be implemented through education on septic tank pump-outs, a septic system installation/repair/replacement program, and hookup to the existing WWTP. In urban areas, reducing the human bacteria loading from leaking sewer lines could be accomplished through a sanitary sewer inspection and management program. Other BMPs that might be appropriate for controlling urban wash-off from parking lots and roads, and that could be readily implemented, may include more restrictive ordinances to reduce fecal loads from pets, improved garbage collection and control, and improved street cleaning.

The iterative implementation of BMPs in the watershed has several benefits:

a. To enable tracking of water quality improvements following BMP implementation through follow up stream monitoring;
b. To provide a measure of quality control, given the uncertainties inherent in computer simulation modeling;
c. To provide a mechanism for developing public support through periodic updates on BMP implementation and water quality improvements;
d. To help ensure that the most cost effective practices are implemented first; and
e. To allow for the evaluation of the adequacy of the TMDL in achieving water quality standards.

Watershed stakeholders will have the opportunity to participate in the development of the TMDL implementation plan. Specific goals for BMP implementation will be established as part of the implementation plan development.