Technical Advisory Committee Meeting #5
Accotink Creek Benthic TMDL Study

Tuesday October 28, 2016 – 9:00 am
Northern Virginia Regional Commission - Meeting Space
3040 Williams Drive, Suite 200
Fairfax, VA 22031

Meeting Attendees:

Chesapeake Bay Foundation (Joe Wood)
Fairfax County Department of Public Works and Environmental Services (Fred Rose, Emily Burton)
Fairfax County Department of Vehicle Services (Marguerite Guarino)
Fairfax County Park Authority (Gayle Hooper, Tony Vellucci)
Fort Belvoir Department of Public Works (Pamela Couch, Camila Goncalves Dias)
Friends of Accotink Creek (Philip Latasa, Kris Unger)
George Mason University (Jane Xu)
Interstate Commission on the Potomac River Basin (Ross Mandel, Heidi Moltz)
Northern Virginia Community College (David Trimble)
Northern Virginia Regional Commission (Corey Miles)
Stantec (Ashley Hall)
Town of Vienna (Christine Horner)
Virginia Department of Environmental Quality (Bryant Thomas, Will Isenberg, Sarah Marsala)
Virginia Department of Transportation (Tracey Harmon)

Meeting Minutes:

The purpose of this meeting is to present and discuss draft Total Maximum Daily Load (TMDL) allocations for sediment and chlorides in the Accotink Creek watershed and to bring the Technical Advisory Committee (TAC) up to speed on changes to models for the sediment and chloride TMDLs. The meeting started out with the Virginia Department of Environmental Quality (DEQ) giving a brief overview of the agenda, followed by a summary of changes since the last TAC meeting. The first of the changes highlighted was a change in the Chloride TMDL model. Following comments at the last TAC meeting that expressed concerns regarding assumptions in the Hydrologic Simulation Program-Fortran (HSPF) model for chlorides, DEQ and the technical support contractors from the Interstate Commission on the Potomac River Basin (ICPRB) investigated new models that would reduce the number of assumptions going into setting a chloride TMDL. The first attempt at reducing assumptions involved using the hydrologic model for flow from the HSPF model and multiplying the stormwater flows by the chloride chronic criterion of 230 mg/L. After more discussion and consideration, it was decided to change to a Load Duration model due to its greater simplicity. DEQ stated that ICPRB will go into more details on the Load Duration model development later in the presentation and also emphasized that with a simpler model, the focus can be shifted to considerations for a

collaborative region-wide implementation effort. DEQ described that the chloride model was being used to generate a seasonally allocated load, with a winter season of November 1 through April 30, and that Municipal Separate Storm Sewer System (MS4) wasteload allocations (WLA) would be aggregated by TMDL watershed. Finally, DEQ stated that another change since the last meeting was that WLAs were calculated for industrial permits in addition to the MS4s.

Following the summary of changes, DEQ continued with the presentation by introducing the three allocation principles. The three allocation principles included:

1. Allocations for impairments do not overlap
2. MS4 allocation is based on the percent area within each TMDL watershed that is MS4 service area; and that
3. MS4 allocations are aggregated due to their interconnectedness, but different approaches were taken for aggregating in the chloride TMDL versus the sediment TMDL.

DEQ elaborated on the first principle by explaining how models used for downstream watersheds may include contributions from upstream watersheds, but the upstream allocations are separate and subtracted from downstream allocations. DEQ explained that this principle is based on allocations representing the total loading to the stream network that is allowable in each TMDL watershed. Next, DEQ stated that spatial data for MS4 service areas were used to calculate the MS4 WLAs. DEQ explained that spatial data was received from Fairfax County, Virginia Department of Transportation, Town of Vienna, Ft. Belvoir, and Fairfax County Public Schools. For Fairfax City, ICPRB digitized maps of their service area submitted by the city as part of Chesapeake Bay reporting, and for George Mason University and Northern Virginia Community College, ICPRB used tax parcel layers to determine their service area. DEQ explained that the MS4 WLA was calculated based on the percent of the watershed area that the service areas covered, and that the remainder of the allocated load went to either industrial stormwater WLA or to the Load Allocation (LA). Following this description, DEQ asked if there were any questions, and there were none.

ICPRB continued the presentation by describing the Load Duration method for setting the chloride TMDL. ICPRB began by explaining that the Load Duration method is an EPA-sanctioned method used in some Virginia Bacteria TMDLs, and that it was also used for chloride TMDLs in Minnesota and New Hampshire. ICPRB described the process of calculating a load duration curve by first calculating a flow duration curve. A flow duration curve is a plot of measured flows on the y-axis based on their percent exceedance on the x-axis. ICPRB provided an example of a flow at the 20% point of a curve and explained that flows on the corresponding y-axis are only exceeded 20% of the time. ICPRB then stated that a load duration curve is constructed by multiplying the flow duration curve by the chloride chronic criterion of 230 mg/L. However, because the chronic criterion applies to a 4 day average, ICPRB described the specific process for deriving the chloride TMDLs for all three TMDL watersheds. ICPRB described the process as follows. First 4-day average flows were calculated using data from 1987-2016 at the USGS gage at Braddock Road on Accotink Creek. Next, ICPRB restricted flows to winter months of November through April. Next, ICPRB calculated the flow duration curve, which was then multiplied by the chloride chronic criterion. Finally, using the ratio of the size

of the watershed draining to the USGS gauge compared to the size of Upper Accotink Creek and Lower Accotink Creek TMDL watersheds to resize the load duration curves in order to set the TMDLs for both TMDL watersheds. ICPRB then explained that for Long Branch the same process was employed, only for Long Branch the flow duration curve was based on flows from the USGS gauge at Braddock Road on Long Branch that had flow data from 2013-2016. ICPRB showed the flow duration curves and load duration curves for both Accotink Creek at Braddock Road and Long Branch at Braddock Road. In the figures for the load duration curves, there were also estimated chloride loads shown in red based on specific conductance data. ICPRB explained that all red points above the blue load duration curve would be violations of the chloride criterion as well as the TMDL. ICPRB explained how the difference between the red points and blue line showed the magnitude of necessary load reductions in Accotink Creek's watershed.

DEQ continued the presentation by describing the process for developing chloride WLAs. DEQ repeated that MS4 WLAs were based on the percent of the watershed that is in any MS4 service area. Similarly, DEQ explained that industrial stormwater WLAs for both Individual Permits and General Permits were based on the percent of the watershed that drains to their outfalls, and that any overlap with MS4 service areas would be subtracted to avoid double counting. DEQ stated that Carwash General Permits, Mixed Concrete General Permits, Construction General Permits, and Cooling Water General Permits would not receive chloride WLAs. Next, DEQ explained that chloride WLAs for MS4s would be aggregated by TMDL watershed, and so would industrial stormwater loads. This is because the load duration model has no spatial resolution as it is derived from stream flow, and because the focus of the chloride TMDLs will be on implementation. The TAC was then prompted to consider how they would like to participate in the next phase of the TMDL, which is envisioned to be some sort of regional collaboration focusing on developing a regional chloride management plan to implement the chloride TMDL. Following this, DEQ presented the draft allocations by TMDL watershed. The TMDL components were broken out, with WLAs being split into MS4 aggregate WLA and Industrial Stormwater aggregate WLA. Corresponding to the allocated loads were percentages compared to the total TMDL. One TAC member asked how the percent was chosen for MS4 WLAs, and DEQ responded that those percentages directly relate back to the percent of the watershed that the MS4 represents. Finally, DEQ explained how this TMDL was based on the load duration curve for November 1-April 30, representing the winter season. Based on some stakeholder requests, DEQ then asked the TAC whether or not they would prefer the seasonal load be represented as a seasonal TMDL or be applied as an annual TMDL. A TAC member asked whether or not it made a difference, and the group agreed that based on the permit reporting year (July 1-June 30) it did not. Ultimately, because implementation efforts, including training, would be year round the group decided to apply the seasonal TMDL annually.

Following this decision, DEQ asked if there were any remaining questions on the chloride TMDL. A TAC member asked if it is possible to achieve water quality standards, and if so what would be the level of effort. DEQ responded that it is difficult to predict as it varies with each winter storm event. This is why the focus is on Best Management Practices (BMPs) and implementation in order to meet this TMDL. One TAC member asked how the WLA would be addressed in permits, and DEQ responded that permit compliance will be based on

documenting actions towards reducing chloride loads through BMPs (e.g., training, equipment, etc.). Through complying with the permit, water quality should improve and eventually meet water quality standards. Another TAC member asked about the TMDL tables, wondering what the existing loads were. DEQ explained that with this load duration method existing loads cannot be estimated. However, using the specific conductance data from in-stream measurements to estimate chloride concentrations, it is estimated that about a 70% reduction in chloride concentration is needed to meet water quality standards. Another TAC member asked what the plans were for follow up monitoring to track the effectiveness of the TMDL. DEQ replied that there will be follow up monitoring, and that while the traditional monitoring effort may not capture all melt events, DEQ can track chloride concentrations during melt events using the USGS gauges that measure specific conductance. At this point another TAC member emphasized that the goal is to focus on BMPs that will eventually get to achieving water quality standards, and that adaptive management will likely be a part of the approach since this pollutant is new to Virginia and we need to balance public safety with water quality. DEQ followed this by prompting the TAC to craft a message to go with the chloride TMDL for when this goes in front of the public. DEQ emphasized that this needs to be sensitive/aware of public safety while also explaining how water quality issues will be addressed. While the TMDL will be implemented through permits, the goal is to have a collaborative effort that will also engage the non-permitted parties such as contractors who de-ice in commercial areas. Finally, a TAC member asked if there was a list of BMPs that existed, and DEQ responded that there are many lists in many disparate places, but that DEQ will work to start a preliminary list for reference.

Following this discussion, ICPRB continued the presentation by presenting on the Sediment TMDL. ICPRB began by explaining revisions to the Lower Accotink Creek sediment model. Since the last TAC meeting, the Lower Accotink Creek sediment model has been changed to be a separate GWLF model, with the Upper Accotink Creek watershed being treated as a point source. This change was made so that a 54% reduction could be applied to the Upper Accotink Creek load in order to reflect the trapping of sediments in Lake Accotink. Similarly, a 54% reduction was applied to loads from streams within the Lower Accotink Creek watershed that drain to the lake. Finally, ICPRB explained that the AllForX calculation for Lower Accotink Creek was revised such that the all forested condition had no trapping from Lake Accotink in its simulation. ICPRB then showed the revised baseline sediment loads by source for each TMDL watershed. ICPRB pointed out that about half of the load going to Lower Accotink Creek comes from Upper Accotink Creek, even after a 54% reduction was applied. Also, while the Upper Accotink Creek and Lower Accotink Creek pie charts showed large loads coming from Long Branch and Upper Accotink, respectively, ICPRB explained that significant portions of all of those tributary loads were streambank erosion. Therefore, in all three TMDL watersheds the major source of sediment was streambank erosion. Next, ICPRB showed the revised AllForX regression that incorporated the revised Lower Accotink Creek AllForX. With this change, the AllForX threshold where the regression line crosses a VSCI of 60 reduced slightly. As a result of this, there were little changes in the draft TMDL reductions for the Upper Accotink Creek and Long Branch watersheds, but because of the change in the AllForX multiplier for Lower Accotink Creek, the draft TMDL reductions went down to 57%. At this point, a TAC member expressed

concern over the 54% lake trapping efficiency that was based on dredging from 1987-2002 since other more recent efficiencies exist. ICPRB responded that this 15 year period over multiple dredging periods represents a long term average. ICPRB continued that each storm event will have different trapping efficiencies based on the size of the sediment loads and the stream flow. Therefore, using a long term average is best for TMDL modeling. A TAC member then expressed the importance of getting it right since other entities have been applying a 40% reduction. ICPRB explained that in doing a sensitivity analysis, using a 40% trapping efficiency had little change in the resulting loads. ICPRB and DEQ then stated that they can work with the TAC member to address this discrepancy between trapping efficiencies, and to run different scenarios to help in the planning process for related projects. A TAC member then asked what the dredging schedule was for Lake Accotink, and another TAC member explained that dredging activities on Lake Accotink are on hold pending the results of this TMDL study. Another TAC member stated that the time period over which the 54% trapping efficiency was calculated may not be applicable to current conditions because the land was less developed then. Discussion followed about the changes in land use in the area, but it was ultimately agreed that Upper Accotink Creek's watershed has maintained a similar footprint throughout that period. Finally, another TAC member asked if the trapping capacity should change once land is developed further, and ICPRB explained that while the trapping capacity may change over time, the model is not on an event by event basis. Instead, looking at the lake overall more fairly represents the long term effect that is a part of setting the TMDL.

Following this discussion, DEQ picked up the presentation by describing the process for developing sediment WLAs. Just like the chloride TMDL, the MS4 WLAs were based on the percent area of the watershed that is covered by MS4 service area. The cooling water general permit in the watershed will not receive a sediment WLA since the cooling water is coming from the public water supply. Construction general permit WLAs were calculated as stormwater flow times 100 mg/L. Carwash general permits and concrete general permit WLAs were calculated by multiplying their TSS permit limits by their average reported flow for each outfall. For concrete facilities with stormwater outfalls, the WLA was calculated by multiplying the stormwater flow by 60 mg/L. Individual industrial stormwater permit WLAs were calculated by multiplying the stormwater flow to an outfall by the permit limit of 60 mg/L, and industrial stormwater general permit WLAs were calculated by multiplying the stormwater flow to an outfall by their benchmark concentration of 100 mg/L. DEQ stated that all WLAs were calculated for each outfall and then summed to get the permit WLA. DEQ then explained that MS4 WLAs were aggregated by municipalities within each TMDL watershed and that construction WLAs were aggregated by TMDL watershed. DEQ justified this by explaining that MS4s are interconnected systems and municipalities are the greater units, whereas construction general permits apply to multiple transient projects that meet the WLA through BMPs and more frequent inspections.

Next, DEQ presented the draft sediment TMDL tables for all three TMDL watersheds. Similar to the chloride TMDL tables the different TMDL components were broken out with the percent of the TMDL for each component shown in the far right column. Each of the TMDL tables also had WLAs grouped for industrial process water and industrial stormwater. Following each TMDL

table, if applicable, the outfall by outfall WLAs were displayed for each of those categories. After showing the TMDLs for all three TMDL watersheds, DEQ asked the TAC if there were any questions. A TAC member asked if DEQ could clarify how the industrial stormwater WLAs will be implemented and if it should be through addressing flow since these entities don't necessarily generate much sediment. DEQ responded that TSS off industrial sites is measurable for some sites, but differs by the industrial activity on site. The 100 mg/L benchmark was used to calculate the WLA since EPA has done research to suggest that industrial activity resulting in concentrations of 100 mg/L or greater need to address the sediment loads by modifying their stormwater pollution prevention plans. DEQ continued that the biggest source of sediments in Accotink Creek is from instream erosion, so flow does play a big role, but it is up to the permittee to determine how they will meet the WLA. Since the WLA are based on permit conditions already in place, DEQ explained, it shouldn't change much about how the permits are implemented. Furthermore, DEQ pointed out that the proportion of the existing loads in Accotink Creek that are from non-MS4 point sources is very small. DEQ continued that MS4 WLAs do include loads from streambank erosion, and that the Load Allocation also includes streambank erosion loads and any other loads not allocated to MS4s and other point sources.

Finally, DEQ presented the next steps, which include drafting the TMDL report, bringing that draft TMDL to the TAC, and then bringing the draft TMDL to the public. DEQ stated that the project has extended its timeline and will have a draft report for the TAC sometime in early to mid-January.

Meeting Presentation:
A copy of the presentation can be found at DEQ's website below:
http://www.deq.virginia.gov/Portals/0/DEQ/Water/TMDL/TMDLDocumentation/Accotink/AccotinkTAC5presentation.pdf