

Middle Fork Holston River and Tributaries Clean-up Study  
Benthic TMDL 1<sup>st</sup> TAC Meeting Minutes

Thursday, September 8, 2022 2:00pm – 3:30pm  
Virginia DEQ Southwest Regional Office  
355-A Deadmore St. Abingdon, Virginia

There were 15 in attendance for this first TAC meeting including 3 from DEQ and 3 from the WSSI/JMU contract team:

Hunter Wyatt – Holston River Soil and Water Conservation District  
Laura Hainsworth – Emory and Henry College  
Baxter Rolan – Washington County Service Authority  
Randall Sullivan – Washington County Service Authority  
Aaron Sizemore – Mt. Rogers Planning District Commission (also representing Smyth County Administrator)  
Wayne Turley – Holston River Soil and Water Conservation District  
Ryan Kiser - Washington County Service Authority  
Ron Seay – Washington County Service Authority  
Bill Moss – Natural Resources Conservation Service  
Jacob Bellinger – Wetland Studies and Solutions, Inc.  
Katie Shoemaker – Wetland Studies and Solutions, Inc.  
Robert Brent – James Madison University  
Martha Chapman – Virginia Department of Environmental Quality  
Kelly Miller – Virginia Department of Environmental Quality  
David Nichols – Virginia Department of Environmental Quality

DEQ Southwest Regional Office TMDL Coordinator, David Nichols, opened the meeting with introductions and also discussed the role of the TAC in the TMDL development. A handout was shared with all participants that included detailed information to supplement the meeting.

David began by discussing the TMDL development process and then provided a brief background on the watershed. This study updates and revises two previously completed TMDLs. Total Maximum Daily Load (TMDL) Development for Cedar Creek, Hall/Byers Creek, and Hutton Creek was completed in December of 2003 and Bacteria and Benthic Total Maximum Daily Load Development for Middle Fork Holston River was completed in October 2009. A kick-off meeting was held in December 2021 to introduce the study and solicit public comments on the development of the TMDL including the formation of this Technical Advisory Committee. Impaired (benthic) segments from these previous TMDLs have been combined into this current study, along with a Greenway Creek segment not previously included in a completed TMDL study.

This study includes a new benthic stressor analysis to determine the most likely pollutant responsible for the impairments. The updated TMDL will address the continued benthic impairment and adjust for future growth, including a proposed expansion to the Hall Creek Waste Water Treatment Plant from 0.63 million gallons/day to 0.95 MGD. This study will report on the sources of the pollutant and recommend reductions to meet a total maximum daily load for the impaired streams.

Following the introductions and background Dr. Robert Brent of James Madison University (JMU) discussed the process that was used to identify the pollutant(s) responsible for the benthic impairment in the eight impaired streams in this TMDL study. This stressor analysis process evaluated all available data using a formal causal analysis approach developed by EPA, known as CADDIS (Causal Analysis Diagnosis Decision Information System). The CADDIS approach evaluates 18 lines of evidence that support or refute each candidate stressor as the cause of impairment. The stressor analysis determined that the most probable stressor in each impaired stream was sediment.

Baxter Rolen (WCSA) raised a question regarding the relationship between stream velocity and sediment load and wondered how that is impacting the watershed. Katie Shoemaker (WSSI) responded by describing the various factors influencing flow and sediment including river size and geometry but ultimately it seems to be land use that has the most impact on sediment in this watershed. The upper impaired section of the Middle Fork Holsten River (Wythe County) appears to be mostly influenced by agriculture. The middle, non-impaired section is strongly influenced by forested areas (less agriculture) and finally the lower impaired section again appears to be less forested compared to the middle of the Middle Fork Holston River.

Katie began discussing the computer model (Generalized Watershed Loading Functions - GWLF) that is being used to develop the sediment TMDL. The GWLF model can incorporate various parameters such as surface runoff, landscape erosion, impervious/urban sediment inputs, streambank/channel erosion, and groundwater discharge. Land cover data from the Virginia Geographic Information Network's 2016 Virginia Land Cover Database (VGIN, 2016) was used to estimate acres of the various land cover categories in each subwatershed. Estimated sediment loading rates could then be applied to each land cover category to estimate the amount of sediment originating from that land cover category in each subwatershed.

Baxter Rolen (WCSA) asked if there were plans to update the 2016 VGIN Land Cover database. Katie responded that there were efforts currently underway and an updated dataset is expected soon. However, in the meantime, it is important to identify any changes in the land cover over (since 2015) that would make the model more accurate. The TAC can be very helpful in identifying these land cover changes (i.e. cropland to pasture). Wayne Turley with the HRSWCD reminded folks that 20-30 years ago there was significant tobacco farming in the area.

Kelly Miller with DEQ discussed nutrient credit banking. There are potentially a few in this watershed where farms are being converted to forests (including a proposal in Lodi). Katie responded that this would be valuable information especially if it included acreage as well as location data.

Aaron Sizemore with the Mt Rogers Planning District Commission commented that the initial impairment was caused by sediment and we are still dealing with the sediment problem 20 years later. Martha Chapman, DEQ Water Monitoring and Assessment Scientist, noted that there has been some improvement in the Virginia Stream Condition Index (VSCI) scores since the initial listing of the streams but not enough to remove them from the impaired waters list.

There were additional discussions related to the monitoring stations. The monitoring stations are relatively unchanged since the sampling efforts for the initial listing back in 1999. There has been the addition of the Greenway Creek segment to the study that was first listed as impaired in 2010. Some segments from the original TMDL have been removed from this current TMDL study. These segments had initially been listed using “best professional judgement” but without any supporting data. Jacob Bellinger with WSSI added that the Tattle Branch creek had a really poor VSCI score of 35 back in 2004 but recent data showed greatly improved scores.

Katie then began the discussion on facilities with permitted sources of sediment in the watershed. The typical sediment load for the point sources were calculated from discharge monitoring report data and used to model the existing conditions. The permits in the watershed included VPDES individual permits, potable water treatment plant, non-metallic mineral mining, vehicle wash, and domestic sewage. There are also 17 industrial stormwater permits and 17 active Virginia Stormwater Management Program construction permits in the study area. Katie made the point that many of these facilities do not actually discharge at the level their permit allows. Katie also noted the proposed expansion to the Hall Creek Waste Water Treatment Plant (estimated maximum discharge = 0.95 million gallons/day) is being evaluated in this new study.

Baxter Rolen (WCSA) asked how precipitation, especially rainfall and flooding events, factored into the data. The discussion that followed transitioned into the Hydrologic Calibration. When appropriate data is available for comparison, calibration can improve the accuracy of GWLF. Historic daily flow data was available from USGS flow gauge #03474000 – Middle Fork Holston at Seven Mile Ford back to 1942. Daily rainfall and temperature data for the watershed was obtained from Oregon State’s spatially distributed PRISM model (Parameter-Elevation Regressions on Independent Slopes Model). Hydrologic calibration was performed as a preliminary modeling step to ensure that hydrology was being simulated as accurately as possible. Leaving a ‘warm-up’ period for the model (year 2000), the years from 2011 to 2020 were used as the calibration period, and years 2001 to 2010 were used as a validation dataset. These ranges are sufficiently long that a range of both dry and wet years are encompassed in each to better assess the model’s performance.

Hunter Wyatt (HRSWCD) commented that these streams were in a very karst area and wondered if the model could account for that. Katie noted that there were parameters in the model that could simulate karst (loss to ground water and loss to shallow groundwater) and can be tweaked in the hydrologic calibration to help match to what we are actually seeing.

David Nichols wrapped up the meeting by reminding participants there will be a second TAC meeting and ultimately a final public meeting at the completion of the TMDL. The date for the second TAC meeting is still to be determined as the contractors and DEQ work through a current issue with inconsistent perennial stream delineation from NHD/NHD+ datasets that are used in developing TSS loads via GWLF model. The high density of perenniality designated by the NHD+ in some areas causes or contributes to their modeling with excess stream bed erosion estimates.