James River, Maury River, and Jackson River PCB TMDL
3rd TAC meeting
11/2/20222

Attendees: Todd Asselborn (Greif Packaging), Jacquelyn Austin (City of Lynchburg), Gavin Blake (DEQ) , Gregg Brelsford (JRPA), Brian Benham (VT BSE), Tony Cario (DEQ-CO), Kristin Carter (UVA), Kevin Crider (DEQ-BRRO), Sharon Drummond (Environmental Standards), Tom Dunlap (JRA), Ashley Hall (Stantec/VDOT), Kelly Hitchcock (Central VA PDC), Anna Killius (JRA), Karen Kline (VT BSE), Nesha Mcrae (DEQ-VRO), Denise Moyer (DEQ-PRO), Jen Palmore (DEQ-PRO), Mark Richards (DEQ-CO), Jen Rogers (Dominion), Lucy Smith (DEQ-BRRO), Jim Taylor (WestRock)

Recap of TAC Meetings:
Mark Richards began the meeting with a review of the project timeline. In support of TMDL development, PCB water column monitoring was performed between 2017 and 2019. The first public and TAC meetings were held early 2021. The second TAC meeting was held in August of 2022, during which the TAC discussed draft PCB allocations. The third TAC meeting wrapped up allocations with the TAC group and answered questions. DEQ plans to hold a final public meeting in winter of 2023 to present the draft TMDL study.

PCB and Water Quality Criteria (WQC) Review:

Mark provided some background on PCBs including how they have been used over time and current water quality criterion and fish tissue thresholds for Virginia. PCB is a legacy contaminant commonly used in transformers, capacitors etc. that was banned in 1977. VDH has a fish tissue consumption advisory of 100 ppb, and DEQ's screening value is 18 ppb (FT) and a corresponding concentration of 640 pq/l for water column data. Virginia is undergoing the triennial review process during which the current water quality criterion is being reviewed. While the fish tissue threshold will remain at 18 ppb, the water quality criterion (WQC) of 640 pg/L will be reduced to 580 pg/L. Additionally, a footnote has been included to address the duration and frequency of the standard, which states that the human health criteria is based on the assumption of the average amount of exposure on a long term basis. DEQ will add an appendix to the TMDL that will include allocations based on the proposed criterion that will readily allow for the TMDL to be modified once the standard is officially changed.

DEQ reviewed a map showing the Jackson, Maury and James Rivers impaired waters for the VDH fish consumption advisory and additional DEQ listings. TMDL source categories and a simplified model schematic were presented showing the waste load allocation (WLA) for permitted sources and the load allocation (LA) for non-regulated sources used to develop the TMDL. The load allocation includes several other variables as well such as contaminated sites like brownfields and DEQ voluntary remediation program sites. The TMDL must meet both the numeric water quality criterion and the fish tissue threshold. Mark explained that site specific endpoints are commonly used to develop TMDLs since PCBs bioaccumulate and biomagnify in fish in contaminated waterways. Overall, the ultimate goal is to reduce existing PCB loads to restore the fish consumption use.

TMDL Endpoints:

The water quality criterion is derived from a single exposure pathway for fish but we know that there are additional pathways. A bioaccumulation factor (BAF) is necessary to capture these other pathways which often results in more protective endpoints below the WQC. Mark reviewed three different scenarios developed by DEQ to look at endpoints where the calculated BAF used: (1) species of commercial/recreational interest with sample size greater than or equal to 8, (2) consumption advisory species regardless of sample size, and (3) consumption advisory species with a sample size greater than or equal to 8. DEQ recommends the selection of scenario 3 that used consumption advisory species with a sample size of 8 or more.

Q. How were these numbers derived? It would be helpful to see the calculations
A. DEQ responded that these calculations are on the DEQ PCB TMDLs website.

Mark discussed how the revision of the water quality criterion will be accounted for in the TMDL process. We have to move forward using the existing WQC during the time of TMDL development, but we will calculate TMDL allocations/reductions needed using the revised criterion as well and place it in an appendix within the TMDL document. The long term average footnote assumes an average amount of exposure on a long term basis (typically a 70 year period). This is a big change in how we interpret the criterion. DEQ's standards staff developed a process to use in developing TMDLs utilizing an appropriate statistic of central tendency to compare the modeled output against the TMDL endpoint. Mark shared an example of how this process could be applied using sample data from the Upper James River. Mark explained that if the modeled output is less than the TMDL endpoint (as is was in two of the project area watersheds), a percentile ranking process would be used to derive allocations.

Q. Is model calibrated to fish tissue data or instream data?
A. Current instream WQ data collected from 2017-2019

Recommended PCB Allocations based on Scenario 3:

Mark discussed the following information from the pie charts and tables. A pie chart for each of the 4 watersheds showed annual relative contribution of PCBs that represented all source categories but not showing those less than 1%. A table following each chart showed the PCB load reduction allocations using the current WQC and revised WQC.

Jackson River:
The Jackson River pie chart shows the greatest sources of PCBs are from nonregulated surface loads (70%) followed by streambed sediment (22%) and permitted sources (8%). The table showing PCB allocations using the current WQC and a TMDL endpoint of 640 pg/L indicate a reduction of 86% for nonregulated surface sources and 51% for permitted point sources. The table showing PCB allocations using the revised WQC and a TMDL endpoint of 580 pg/L indicate a reduction of 19% for nonregulated surface sources and 56% for permitted point sources.

Q. Why more reductions to permitted sources when the majority of load is from nonregulated?
A. The permitted loads are calculated outside of the model and used a fixed approach to calculate the WLAs. A requirement of our permit programs do not allow permitted sources to discharge bioaccumulative pollutants above the WQC (i.e., meet at end-of-pipe) so this number was used to calculate the WLAs.

Q. For existing standard the number for permitted sources and nonregulated sources is higher than new standard. Why?
A. Model output drives non-regulated sources. The drastic difference is due to how the standard is applied using a 0% exceedance for the current standard and a long-term average for the proposed standard so exceedances are allowed.

Comments and discussion on standards and modeling:
Brian Benham commented on a question that the model performs the same but the difference in load allocations is how the current and proposed standard is applied. The revised standard is lower (580 pg/l) but uses a long term average instead of a 0% exceedance rate thus evening out spikes from runoff events. As a result, permitted reductions increase with a revised WQC because the criteria is lower and nonregulated sources have less reductions with the revised criteria as a result of using the long term average.

Additional notes on discussion:
Mark shared how allocations would change based on application of the revised WQC of 580 pg/L. This resulted in a large drop in reductions for the non regulated load and a small increase in the permitted load reduction needed. Mark explained that non-point source allocations are derived based on the model output, but that a standard process is used to calculate existing loads for point sources based on average flow rates over time. The design flow for a wastewater treatment system is used for the WLA. One participant asked why the point source reductions are so much higher than the non point source reductions in the Jackson despite the fact that the non point source load is much greater. Mark responded that there are mechanisms to regulate permitted sources whereas it is far more difficult to address unregulated sources. Another participant asked why the reductions needed from non-point sources dropped so much with the new criterion even though the new criterion is lower than the old one. Brian Benham explained that with the

new standard that does not include a 0% exceedance restriction, fewer reductions are required in order to address runoff driven exceedances occurring during rain events. Mark moved through the relative contribution and source allocation data for each project area, also sharing allocations using the revised WQC.

Maury River

The Maury River pie chart shows the greatest sources of PCBs are from nonregulated surface loads (92%) followed by permitted sources (8%). The table showing PCB allocations using the current WQC and a TMDL endpoint of 400 pg/L indicate a reduction of 94% for nonregulated surface sources and 99.3% for permitted point sources. The table showing PCB allocations using the revised WQC and a TMDL endpoint of 400 pg/L indicate a reduction of 0% for nonregulated surface sources and 99.3% for permitted point sources. Again the changes are due to applying long term average of the standard.

Upper James River

The upper James River pie chart assumes reductions already made upstream. It shows the greatest sources of PCBs are from regulated surface loads (57%) followed by nonregulated surface load (35%) and permitted contributions (5%). The table showing PCB allocations using the current WQC and a TMDL endpoint of 120 pg/L indicate a reduction of 99% for permitted sources, 90% for regulated/nonregulated surface sources, and 68% for CSOs. The table showing PCB allocations using the revised WQC and a TMDL endpoint of 120 pg/L indicate a reduction of 99% for permitted point sources, 25% for regulated/nonregulated surface sources, and 68% for CSOs. Again the changes are due to applying long term average of the standard.

Q. Are the contributions from the Lynchburg MS4 included in the surface load regulated category for the Upper James watershed
A. Yes, they are included.

Q. Is the 25% permitted contributions from upper James only?
A. It does not include loads from the Maury or Jackson Rivers. The reductions needed in the Upper James assume an 85% reduction from the Maury and Jackson Rivers, which is based on the allocations needed in these upper watersheds.

Q. Are the reductions for the CSOs representative of the long term control plan, from the start point or the current date?
A. Karen responded it's from the current, but Lynchburg representatives said this was not possible since they don't have a permit yet. Karen explained that the reduction comes from the long term control plan. A representative asked if Lynchburg is removing the flow from the CSO and treating this water, where does this load go, does it mean that the treatment plant reduction will increase? Brian and Karen explained that the 68% reduction in loads from CSOs is based on the long term control plan that the City of Lynchburg has developed, and does not represent an additional 68% reduction on top of what will be accomplished through the plan. Another participant asked for clarification regarding assumptions used to develop the allocation for the water treatment plant. Karen explained that this allocation is based on the design flow of the facility and does not reflect an increase in flow due to correction of the CSOs and more water being directed to the plant.

Q. Why 99% reduction of the permitted source when it does not comprise very much of the load?
A. The permitted source is calculated outside of the model and is based on the TMDL endpoint. So in the Upper James River scenario the end of pipe for permits is 120 pq/L (used to calculate the WLA).

Lower James

The lower James River pie chart assumes reductions already made upstream. It shows the greatest contributing sources of PCB in this segment are from regulated surface loads (64%) followed by nonregulated surface load (8%) and permitted contributions (2%). The table showing PCB allocations using the current WQC and a TMDL endpoint of 52 pg/L indicate a reduction of 98% for permitted point sources, 98% for regulated/nonregulated surface sources, and 92% for CSOs. The table showing PCB allocations using the revised WQC and a TMDL endpoint of 52 pg/L indicate a reduction of 98% for permitted point sources, 35% for regulated/nonregulated surface sources, and 92% for CSOs. Again the changes are due to applying long term average of the standard.

Mark shared a summary table of all of the reductions for each watershed based on application of scenario 3. He also shared information that went into the decision making process for selecting scenario 3. For scenario 1, MS4s in the Richmond area would have a 0% reduction, which is problematic since we know they are contributing PCBs. In scenario 2, MS4 further up in the watershed would have a 45% reduction whereas the MS4s in the Richmond metro area would not have a reductions. Of note, the fish are heavily contaminated in these areas.

Q. Why was scenario 1 not selected?
A. Mark explained that the endpoint for Rock bass was the driver of the TMDL endpoint, pushing DEQ to default to the WQC (one species skews the data considerably since it has a very high endpoint). This fish species has a very low lipid content (PCBs are fat loving) and does not represent or would it protect the afflicted fish species.

Additional notes on discussion:
A participant asked if the older data is skewing goals too, Mark responded that the newer data is consistently high (particularly carp and catfish), there is still a considerable amount of contamination shown in the 2017-2019 data. Another participant asked about the cutoff of 8 used to derive the different scenarios. Mark explained that this was based on the findings of a study on the Potomac River conducted by the ICPRB. Another participant noted that he recalled voting on using Scenario 1 during the first TAC meeting, he felt that it was unfair to ask upstream sources to do more just to ensure that the Richmond MS4 has reductions to accomplish. The summary from the first TAC meeting was reviewed, no input was received on a preferred scenario during the meeting so DEQ agreed to use Scenario 1 as a starting point for the allocation development process.

Mark moved on to discuss the implementation process, responding to concerns about upstream allocations and how reductions will be accomplished.

TMDL Cost Benefit Analysis:

Mark noted a new requirement of a regulatory economic review of the TMDL, which will focus on the wasteload allocation since this is the regulated component of the TMDL. DEQ will be seeking input on the costs and benefits of accomplishing reductions from point sources.

The WLA of the TMDL equation is regulatory so we need to develop a cost benefit analysis
DEQ would like input on this.

Q. A participant asked if PCB TMDLs will be incorporated into the new stormwater industrial permit.
A. Mark explained that these facilities are identified as sources of PCBs and included in PCB TMDLs based on their SIC codes. Mark explained that special conditions are included in permits for facilities that reference development of a pollutant minimization plan (PMP). These plans include long term goals for reducing PCBs with the understanding that these goals are hard to reach and will take considerable time.

Wrap up:

Mark noted next steps in the process including a final public meeting, hopefully in early 2023. A participant asked about development of an implementation plan to address the TMDL. Mark explained that we haven't been developing implementation plans for PCBs to date, that the implementation focus has been on permitted sources, but that we will need to start looking at how to meet the non-point source loadings as well.

Mark thanked participants for their input and the meeting was adjourned.