FINAL

Comment Response Document
Regarding the Total Maximum Daily Load (TMDL) of Polychlorinated Biphenyls (PCBs) in the Back River Oligohaline Tidal Chesapeake Bay Segment, Maryland

The Maryland Department of the Environment (MDE) has conducted a public review of the proposed PCB TMDL for the Back River Oligohaline Tidal Chesapeake Bay Segment. The public comment period was open from August 26, 2011 through September 26, 2011. MDE received two sets of written comments.

The commentors, their affiliations, the date comments were submitted, and the numbered references to the comments submitted are identified below. In the pages that follow, comments are summarized and listed with MDE's response.

List of Commentors

Author	Affiliation	Date	Comment Number
Kevin Brittingham	Baltimore County Department of Environmental Protection and Sustainability	September 26, 2011	1-4
Dana Cooper	Baltimore City Department of Public Works	September 26, 2011	5-10

Comments and Responses

1. The commentor states that the Wastewater Treatment Plant (WWTP) tPCB baseline loads are based on 2006 data. The commentor then asks if more recent data is available to provide a more accurate estimate of current tPCB concentrations in WWTP effluent?

   Response: The 2006 WWTP effluent tPCB concentration data is the most recent data available for estimating the tPCB baseline loads for the WWTP in this TMDL. A data solicitation was conducted, and all readily available data from the past five years was considered in this TMDL. Effluent samples from the WWTP were analyzed for PCBs using a full congener based, ultra-low detection level method [US Environmental Protection Agency (EPA) method 1668]. These effluent samples should be representative of tPCB concentrations in the applicable WWTP's effluent. The concentrations would not be expected to have declined significantly over the past five years, since PCBs are a persistent, bioaccumulative compound that degrade slowly over time. Even though the baseline load estimates could potentially change if more recent effluent tPCB concentration data were available, the WLA for the facility, calculated based on the water column tPCB TMDL endpoint (for the Baltimore Harbor, since the facility has two outfalls but a single waste treatment stream: see section 5.0 of the main TMDL for further details) and the design flow for the facility's applicable outfall in the watershed, would remain the same. It is expected that this facility will be required to characterize tPCB concentrations in its effluent in the future, when its permit is renewed, since MDE's NPDES permitting program has

incorporated this requirement in other recently renewed WWTP permits. This future monitoring will lead to a refinement of the estimated tPCB baseline loads from the facility.

2. The commentor states that the tPCB atmospheric deposition rate applied within the TMDL is based on a 1999 study. The commentor then asks if more accurate data are available for estimating tPCB atmospheric deposition rates?

   Response: The tPCB atmospheric deposition rate of 16.3 micrograms per square meter per year ($\mu g/m^2$/year) from the Chesapeake Bay Program's (CBP) 1999 Atmospheric Deposition Study is the most accurate data available for estimating tPCB baseline loads from atmospheric deposition for urban areas within this TMDL. This depositional rate is within the range defined by Bamford et al. (2002) for the Baltimore Harbor watershed, which is expected to be similar to the applicable rate for the Back River watershed; however, the study did not specifically estimate rates for urban and non-urban areas. Therefore, CBP's estimate is more precise, and thus more applicable for this analysis. The depositional rate applied within this TMDL was also used to estimate tPCB baseline loads for urban areas in the Tidal Potomac and Anacostia River PCB TMDL, which was approved by the EPA in 2007.

3. The commentor states that the sediment and fish tissue tPCB concentration data is insufficient relative to the support of model development.

   Response: The sediment and fish tissue tPCB concentration data were not directly applied in the development of the model for the Back River PCB TMDL. Sediment tPCB concentration data are applied as the initial condition for establishing the sediment tPCB concentration profile within the embayment. Sediment samples were collected from 20 monitoring stations, and these samples were subsequently analyzed for PCBs, thus providing sufficient information for characterizing sediment tPCB levels in the Back River embayment. The model, however, was successfully calibrated based on the water column tPCB concentrations within the embayment. Thus, MDE contends that there was sufficient sediment tPCB concentration data available to establish an initial condition within the modeling framework.

   Fish tissue tPCB concentration data was applied in the calculation of site-specific bioaccumulation factors for various fish species in the Back River embayment, in order to develop tPCB TMDL endpoints for the water column and sediment. This information is not directly applied in the development of the model and the simulation of tPCB water column and sediment concentrations. A significant amount of fish tissue concentration data was available for developing the TMDL endpoints. Forty-four fish tissue composites (minimum of five fish in each composite) from different fish species (i,e. white perch, channel catfish, etc.) were used to calculate the bioaccumulation factors. Thus, MDE contends that there was sufficient fish tissue tPCB concentration data available for use in the development of the applicable water column and sediment tPCB TMDL endpoints.

4. The commentor says that it is unclear how the target reduction percentages were determined, since WWTP effluent and urban stormwater monitoring studies have not been completed. More accurate targets could be calculated, if data from these sources were included.

   Response: Target reduction percentages within the TMDL were calculated based on the estimated tPCB baseline loads from the WWTP and watershed sources (non-regulated watershed runoff and NPDES regulated stormwater) and the reductions required within the model to meet the water column and sediment tPCB TMDL endpoints. For the WWTP, the tPCB baseline was estimated based on observed tPCB effluent concentration data and the average flow for the facility. The WLA for the WWTP was calculated based on the water column tPCB TMDL endpoint (for the Baltimore Harbor, since the facility has two outfalls but a single waste treatment stream: see section 5.0 of the main TMDL for further details) and the design flow of the facility's applicable outfall in the watershed. Therefore, the target reduction is merely based on the difference between the estimated baseline load and WLA for the facility.

   For watershed runoff, the tPCB baseline loads were estimated based on observed tPCB concentration data from a monitoring station in the Back River embayment's watershed. Monthly samples were collected over an annual period in order to capture the seasonal and critical conditions for tPCB loads from the watershed. This station characterizes the tPCB loads from non-regulated watershed runoff and NPDES regulated stormwater throughout the watershed. Using this information, a regression was developed between the observed tPCB loads from the monitoring station and the observed flow at a nearby United States Geological Survey (USGS) station. With this relationship established, the flow time series from CBP's Phase 5 Watershed Model was applied to develop a tPCB load time series for incorporation into the model as the tPCB baseline load for the watershed. No stormwater monitoring studies are required to improve the baseline load estimates for the watershed. This loading time series is applied in the model and reduced under the TMDL scenario in order to achieve the TMDL endpoints necessary for protecting the fishing designated use of the embayment. The reductions defined by this scenario establish the WLAs and LAs for the TMDL. The total watershed allocation is apportioned between the LA and WLA for non-regulated watershed runoff and NPDES regulated stormwater, respectively, based on the percentage of urban and non-urban land cover within the watershed.

5. The commentor says that it is unrealistic to set a percent reduction of an undetermined mass of PCBs from ubiquitous sources. Since the target size is completely uncertain, Baltimore City and other stakeholders could be required to achieve a 91% reduction of zero, or be obligated to reduce a quantifiable number so infinitesimally small that it would neither impact the receiving waters nor make financial sense. The proposed TMDL implies that there is an active controllable source of PCBs that can be reduced or eliminated. Since no data in the parts per quadrillion range exist for the WWTP or urban stormwater, we are unable to determine if this is accurate or not. At a time when the City and other Maryland jurisdictions are attempting to comply with numerous clean water mandates, this level of uncertainty is troubling at best.

Response: The target reductions have been calculated from tPCB baseline loads estimated based on observed data and the associated WLAs/LAs required to achieve the TMDL endpoints. The reductions have not been assigned based on an undetermined tPCB load. The target size should not be considered as completely uncertain since the tPCB baseline loads are calculated based on actual monitoring data. Ongoing sources of PCBs do exist in the back River embayment's watershed, as water column samples from the WWTP and the watershed monitoring station have been analyzed for PCBs using congener based methods with detection levels sufficient for measuring concentrations in the nanograms per Liter (ng/L), or parts per trillion (ppt), range. MDE contends that there is not significant uncertainty in the estimation of baseline loads within the TMDL, since the calculations are based on observed tPCB concentrations from the various sources.

6. Although the commentor recognizes that it may be difficult to quantify, it is still believed that the proposed TMDL lacks the necessary information to estimate tPCB loads from atmospheric deposition and how the proposed 40% reduction to this source sector will be achieved.

   Response: Atmospheric deposition is a significant source of PCBs within the environment, as existing land sources of PCBs are highly volatile. Therefore, PCBs will enter the atmosphere from these land sources and redeposit through dry and wet atmospheric deposition. The incineration of PCB containing materials is also a source of PCBs to the atmosphere. Since atmospheric deposition is not a directly controllable source, the reduction will be achieved by eliminating the sources of PCBs within the environment (i.e., land sources via which PCBs volatize to the atmosphere). Via the implementation process, reductions to watershed sources of PCBs will result in a reduction to the tPCB loads associated with atmospheric deposition as well.

7. The commentor says that TMDLs are required to set daily loads of target pollutants. The proposed TMDL, however, appears weak in identifying or limiting the use of the defined Maximum Daily Loads (MDLs), as compared to the average annual TMDL WLAs and LAs. Since long-term fish flesh accumulation is the endpoint applied within the analysis, PCB TMDLs represent a circumstance where the daily allocations are not useful relative to implementation. The City recommends that MDE acknowledge this in the documents.

   Response: MDE agrees with the commentor that the fluctuation of daily PCB loads to the embayment do not influence long-term bioaccumulation in the aquatic food chain and thus the protection of the "fishing" designated use. However, EPA regulations require that MDE incorporate MDLs in every TMDL. The TMDL does state that the inclusion of a WLA for the WWTP does not reflect a determination to impose end of pipe effluent limitations in a future permit. Also, the assurance of implementation section states that BMP based non-numeric water quality based effluent limits are applicable for regulating PCB discharges from NPDES regulated sources. The inclusion of MDLs for these regulated sources would

not impose unnecessary regulation, if effluent limitations are not defined for individual outfalls.

8. The commentor notes that EPA's method for analyzing PCB congeners has already been replaced once, as the original method was unreliable, and the new method, 1668B, has unrealistic quality control acceptability requirements. Furthermore, another method (1668C) will likely be promulgated in the near future. This suggests that data that has already been generated may be questionable.

   Response: The WWTP tPCB concentration data was analyzed using EPA Method 1668A. Even though revisions to this method have improved the quality control acceptability requirement, this does not preclude that the information is incorrect. The original method was approved by EPA, and samples analyzed under this method are applicable for use in this TMDL. This information was solely used for estimating the baseline load for this facility. It is also anticipated that this facility will be required to characterize tPCB concentrations in its effluent in the future, when its permits is renewed, since MDE's NPDES permitting program has incorporated this requirement in other recently renewed WWTP permits. This future monitoring will lead to a refinement of the estimated tPCB baseline loads from the facility.

9. The commentor states the implementation of the TMDL is concerning. It is Baltimore City's strongly held opinion that BMP-based implementation provisions are more appropriate than numerical limitations in the PCB TMDLs. While the TMDL discusses the use of BMPs for implementation, the City would like MDE to commit to BMPs as the exclusive implementation strategy.

   Response: The assurance of implementation section of the TMDL suggests that the BMP non-numeric water quality based effluent limits for NPDES regulated sources be applied for implementing the required reductions. The request to include a statement that MDE will commit to BMPs as the exclusive implementation strategy falls outside the scope of this TMDL. The specific strategy applied for implementation will be determined when the City owned and operated WWTP is due for permit renewal and the City's municipal separate storm sewer system permit (MS4) is due for renewal, which will require the City to develop an implementation plan that demonstrates how the jurisdiction plans to work toward achieving NPDES regulated stormwater WLA .