



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

Richard Eskin, Ph.D., Director
Technical and Regulatory Service Administration
Maryland Department of the Environment
1800 Washington Blvd., Suite 540
Baltimore, Maryland 21230-1718

MAR 22 2011

Dear Dr. Eskin:

The U.S. Environmental Protection Agency (EPA), Region III, is pleased to approve *Total Maximum Daily Loads (TMDLs) of Polychlorinated Biphenyls in the Corsica River of the Lower Chester River, Mesohaline Segment, Queen Anne's County, Maryland*. The TMDL report was submitted via the Maryland Department of the Environment's (MDE) letter dated September 28, 2009, for review and approval by EPA. Also, based on EPA's comments, MDE sent a final revised TMDL report March 4, 2011. The TMDL was established and submitted in accordance with Section 303(d)(1)(c) and (2) of the Clean Water Act to address impairments of water quality as identified in Maryland's Section 303(d) List. The Corsica River of the Lower Chester River, Mesohaline Segment (MD-CHSMH-02130507), was included on Maryland's Section 303(d) List as impaired by tPCBs and was included on the State's Integrated Report as impaired by the following pollutants (listing year in parentheses): nutrients (1996; MD-CHSMH), sediments (1996; MD-CHSMH, later changed to a total suspended solids listing), fecal coliform (1996; MD-CHSMH-Corsica River), polychlorinated biphenyls in fish tissue (2002; MD-CHSMH-02130507), and impacts to biological communities (2002; MD-CHSMH). This TMDL addresses the PCBs impairment only.

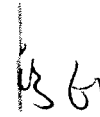
In accordance with Federal regulations at 40 CFR §130.7, a TMDL must comply with the following requirements: (1) be designed to attain and maintain the applicable water quality standards; (2) include a total allowable loading and as appropriate, wasteload allocations for point sources and load allocations 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. In addition, these TMDLs considered reasonable assurance that the TMDL allocations assigned to the nonpoint sources can be reasonably met. The enclosure to this letter describes how the PCBs TMDLs for the Corsica River of the Lower Chester River, Mesohaline Segment, satisfy each of these requirements.

As you know, all new or revised National Pollutant Discharge Elimination System permits must be consistent with the TMDL wasteload allocation 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 October 1, 1998.

If you have any questions or comments concerning this letter, please do not hesitate to contact María García, at 215-814-3199.

Sincerely,

(Signed



Jon M. Capacasa, Director
Water Protection Division


Enclosure

cc: Lee Currey, MDE-TARSA
Melissa Chatham, MDE-TARSA



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

Decision Rationale
Total Maximum Daily Loads of
Polychlorinated Biphenyls in the Corsica River of the
Lower Chester River, Mesohaline Segment
Queen Anne's County, Maryland

Signed 
Jon M. Capacasa, Director
Water Protection Division

Date: 3-22-11

Decision Rationale
Total Maximum Daily Loads
Polychlorinated Biphenyls in the Corsica River of the
Lower Chester River, Mesohaline Segment
Queen Anne's County, Maryland

I. Introduction

The Clean Water Act (CWA) requires a Total Maximum Daily Load (TMDL) be developed for those waterbodies identified as impaired by the 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 waterbody without exceeding water quality standards.

This document sets forth the U.S. Environmental Protection Agency's (EPA) rationale for approving the TMDLs for total polychlorinated biphenyls (tPCB) in the Corsica River of the Lower Chester River, Mesohaline Segment (also referred to as the Corsica River embayment). The TMDL was established to address impairments of water quality, caused by tPCB in fish tissue, as identified in Maryland's 2002 Section 303(d) List for water quality limited segments. The Maryland Department of the Environment (MDE) submitted the report, *Total Maximum Daily Loads of Polychlorinated Biphenyls in the Corsica River of the Lower Chester River, Mesohaline Segment, Queen Anne's County, Maryland*, dated September 2009, to EPA for final review on September 28, 2009. Based on EPA's comments, MDE sent a final revised TMDL report to EPA for review and approval on March 4, 2011. The TMDL in this report addresses the tPCB impairment in the Corsica River of the Lower Chester River, Mesohaline Segment as identified on Maryland's Section 303(d) List. The Integrated Report Assessment Unit Identification for the Corsica River embayment is MD-CHSMH-02130507.

EPA's rationale is based on the TMDL Report and information contained in the computer files provided to EPA by MDE. EPA's review determined that the TMDLs meet the following seven regulatory requirements 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 (WLA) and load allocations (LA).
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, these TMDLs considered reasonable assurance that the TMDL allocations assigned to nonpoint sources can be reasonably met.

II. Summary

The TMDL specifically allocates the allowable total polychlorinated biphenyls (tPCBs) loading to the Corsica River of the Lower Chester River, Mesohaline Segment. There is one permitted point source of tPCBs that is included in the WLA. The fact that the TMDL does not assign WLAs to any other sources in the watershed should not be construed as a determination by either EPA or MDE that there are no additional sources in the watershed that are subject to the NPDES program. In addition, the fact that EPA is approving this TMDL does not mean that EPA has determined whether some of the sources discussed in the TMDL, under appropriate conditions, might be subject to the NPDES program. The annual average TMDL and Maximum Daily Load (MDL) for tPCB are presented in Tables 1 and 2, respectively. Individual annual and maximum daily WLAs for the permitted point source is provided in Table 3. Note that the MDLs were developed based on EPA guidance and the methods used are specific to each source as described in Appendix G of the TMDL document.

**Table 1. Corsica River of the Lower Chester River, Mesohaline Segment
Annual Average TMDL (grams/year)**

TMDL	=	LA	+	WLA	+	MOS
756		679.2	+	1.3 ⁽¹⁾	+	75.6

(1) WWTP Loads were considered to be *de minimis*.

**Table 2. Corsica River of the Lower Chester River
Mesohaline Segment MDL (grams/day)**

TMDL	=	LA	+	WLA	+	MOS
7.463		6.706	+	0.011 ⁽¹⁾	+	0.746

(1) WWTP Loads were considered to be *de minimis*.

**Table 3. Wasteload Allocations for Permitted Point Sources in the
Corsica River of the Lower Chester River, Mesohaline Segment**

Facility	NPDES Permit Number	Annual Average TMDL (grams/year)	Maximum Daily Load (grams/day)
Centreville ⁽¹⁾	MD00	1.3	0.011

(1) WWTP Loads were considered to be *de minimis*.

The TMDL is a written plan and analysis established to ensure that a waterbody will attain and maintain water quality standards. The TMDL is a scientifically based strategy that considers current and foreseeable conditions, the best available data, and accounts for uncertainty with the inclusion of a MOS value. The option is always available to refine the TMDL for resubmittal to EPA for approval if environmental conditions, new data, or the understanding of the natural processes change more than what was anticipated by the MOS.

III. Background

The Corsica River watershed is located within Queen Anne's County. It drains to the

Chester River, which eventually drains to the Chesapeake Bay. The tidal portion of the watershed extends from its confluence with the Chester River to the Town of Centreville. The tidal range is 1.6 feet (0.488 m) based on the United States National Oceanic and Atmospheric Administration tidal station in Centreville Landing, Maryland. The depths of the river range from about 1-2 feet (0.3-0.6m) at the headwaters of the tidal embayment to greater than 15 feet (4.6 m) prior to its confluence with the Chester River.

There are three Tier II (i.e., high quality) stream segments (Benthic Index of Biotic Integrity/Fish Index of Biotic Integrity aquatic health scores > 4 – scale 1 to 5) located within the watershed requiring the implementation of Maryland's antidegradation policy procedures. These include: Alder Branch, Mill Stream Branch, and Three Bridges Branch (COMAR 2009d). The total population in the Maryland portion of the Corsica River watershed is approximately 8,000 (US Census Bureau 2000).

The entire Corsica River watershed stretches over approximately 39 square miles (102 kilometers (km²)). The tidal portion of the river is approximately 6 miles (9.7 km) in length. The watershed is predominately rural in nature consisting of 32.1% forest, and 48.3% agricultural land.

The MDE has identified the waters of the Corsica River of the Lower Chester River, Mesohaline Segment on the State's Integrated Report as impaired by the following pollutants (listing year in parentheses): nutrients (1996; MD-CHSMH), sediments (1996; MD-CHSMH, later changed to a total suspended solids (TSS) listing), fecal coliform (1996; MD-CHSMH-Corsica River), polychlorinated biphenyls (PCBs) in fish tissue (2002; MD-CHSMH-02130507), and impacts to biological communities (2004; MD-CHSMH). Nitrogen and phosphorus TMDLs and a fecal coliform TMDL for the restricted shellfish harvesting portion of the Corsica River were approved by EPA in 2000 and 2005, respectively. The sediments listing will be addressed via the Chesapeake Bay TMDL scheduled to be established by the end of 2010. This TMDL addresses the PCBs impairment only.

The Maryland water quality regulations state that all surface waters of Maryland shall be protected for water contact recreation, fishing, and protection of aquatic life and wildlife (COMAR 2007a). The specific designated use for the Corsica River of the Lower Chester River, Mesohaline Segment (also referred to as the Corsica River embayment) is Use II – Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting (COMAR 2007b). The Corsica River of the Lower Chester River, Mesohaline Segment (MD-CHSMH-02130507), is identified as impaired by PCBs on the State's Integrated Report based on fish tissue PCB data from MDE's monitoring program that exceeded the tPCB fish tissue listing threshold of 39 nanograms/gram (ng/g, ppb) - wet weight (MDE 2008, 72-74).

CWA Section 303(d) and its implementing regulations require that TMDLs be developed for waterbodies identified as impaired by the State where technology based and other required controls do not provide for attainment of water quality standards. The tPCB TMDL submitted by MDE is designed to allow for the attainment of the Corsica River of the Lower Chester River, Mesohaline Segment's designated uses and to ensure that there will be no tPCB impacts affecting aquatic health in the watershed. Refer to Tables 1 and 2 above for a summary of allowable loads.

To establish baseline and allowable pollutant loads for this TMDL, a tidal prism model, which incorporates the influences of both fresh water discharge and tidal flushing was used to simulate the dynamic interactions between the water column and bottom sediments within the Corsica River embayment and the Chester River. Within the Corsica River embayment, the processes affecting the transport of PCBs throughout the water column include: the tidal influence, fresh water discharge, the exchange with the atmosphere (through deposition and volatilization) and the exchange with the bottom sediments (through diffusion, resuspension, and settling). Tidal influence (Lower Chester conveying tPCB loads from the Chesapeake Bay) and resuspension and diffusion from the bottom sediments are the dominant processes affecting the sources of PCBs to the Corsica embayment.

Both point and nonpoint sources were identified as contributing tPCB loads to the Corsica River embayment. Nonpoint sources include:

- *Lower Chester Influence (Conveying tPCB loads from the Upper Chesapeake Bay).* Based on the tPCB concentrations measured at the mouth of Corsica River to the embayment during the flood tides, the Lower Chester River tPCB Baseline Load of 936.6 g/year is the major source of tPCBs to the Corsica river embayment. Analysis has shown that tPCB concentrations in the Upper Chesapeake Bay are decreasing at a rate of 6.5 percent per year (Ko and Baker 2004). This rate was applied in the model to account for the expected temporal changes in tPCB concentrations at the Corsica River embayment boundary.
- *Bottom Sediments (Resuspension and Diffusion).* Because PCBs tend to bind to sediments, a large portion of the tPCB loads delivered to the embayment from various sources will quickly end up in the bottom sediments. This accumulation of PCBs can subsequently become a significant source of PCBs to the water column in the embayment. Based on the measured tPCB concentrations in the water column and bottom sediments, the Bottom Sediment tPCB Baseline Load of 510.8 g/year is the second largest source of tPCBs to the Corsica River embayment.
- *Atmospheric Deposition.* The TMDL analysis accounts for both atmospheric deposition and volatilization. The observed annual atmospheric tPCB loading to the entire surface of the Chesapeake Bay is approximately 38 ± 7 kg/year (Leister and Baker 1994). Based on the Chesapeake Bay surface area of 1.15×10^{10} m² and Corsica River embayment surface area of 5.391×10^6 m², the estimated direct tPCB atmospheric deposition to the surface of the Corsica River embayment is 17.8 g/yr. The watershed runoff calculation (see below) accounts for the atmospheric deposition load to the watershed land surface.
- *Watershed Runoff:* The Total Watershed tPCB Baseline Load of the Corsica River was estimated by multiplying the mean ambient water column tPCB concentration (0.38 ng/L) observed at the nontidal watershed stations by the average watershed stream flow. Using the 9-year monthly mean flow at the United States Geological Survey (USGS) station located at Sallie Harris Creek (USGS 01492500) and the ratio of the Corsica River watershed area to the USGS station drainage area, the Corsica River watershed average stream flow was estimated to be equal to 1.24 m³/s (43.7 cfs). The average stream flow was then used to calculate the tPCB baseline load (14.9 g/yr).

Point sources include only one Wastewater Treatment Plant (WWTP). The estimated tPCB baseline load for this facility was calculated based on the permit design flow and the measured tPCB concentration of 1.85 ng/L. While discharge from this facility is seasonal, to account for a possible worst case scenario in the TMDL analysis a year round discharge has been assumed. The estimated baseline load is 1.28 g/year.

For NPDES regulated stormwater, MDE estimates pollutant loadings based on urban land use classification within a watershed. This methodology assumes certain relationships between specific Maryland Department of Planning urban land use classification and various categories of NPDES regulated stormwater permits, whereby the identification of the existing permits determines what portion of the urban land use is considered regulated. Based on this information, the Chesapeake Bay Program Phase 5 land use classification used in this TMDL analysis can be refined into more detailed classification associated with specific categories of NPDES regulated stormwater permits which can subsequently be used to estimate the NPDES regulated stormwater baseline load. The only NPDES regulated stormwater permits in the watershed include state and federal general municipal separate storm sewer system (MS4s), industrial facilities, and construction sites, collectively termed "Other Regulated Stormwater". Applying MDE's methodology, the areas regulated by the NPDES stormwater permits are represented by the CBP P5 urban land use categories associated with MDP industrial and institutional land use classifications. However, since these areas comprise a relatively small percentage of the total watershed area (2%), it was determined that the characterization of the associated tPCB loads was not practical. Consequently, NPDES regulated stormwater tPCB loads have not been characterized. Instead these loads are included as part of the overall nonpoint source load.

The observed tPCB concentrations were used as the model inputs representing baseline (2006) conditions. Based on the available literature, the TMDL methodology assumes that on average the tPCB concentrations in the Upper Chesapeake Bay are decreasing at a rate of 6.5% per year (Ko and Baker 2004). All other inputs (i.e., fresh water inputs, tidal exchange rates, atmospheric exchange rates, sediment and water column exchange rates, and burial rates) were kept constant.

The model was run for 20,000 days to predict the time needed for the water column tPCB concentration to meet the site-specific tPCB water column TMDL endpoint. The results indicated that when the site-specific water column TMDL endpoint (0.35 ng/L) was met, the site-specific sediment TMDL endpoint (8.7 ng/g) was met as well. Simulation results showed that after 3,206 days (about 9 years) the tPCB water column concentration reached 0.35 ng/L, at which time the sediment tPCB concentration was equal to 2.1 ng/g.

The Lower Chester River (conveying tPCB loads from the Chesapeake Bay) as well as resuspension and diffusion from the bottom sediments are the two primary sources of tPCB baseline loads resulting in the impairment in the Corsica River embayment. Attainment of the site-specific tPCB water quality TMDL endpoints will only be possible with significant reduction in these primary loadings, which is expected to take place over time as the Upper Chesapeake Bay concentrations continue to decline resulting also in natural attenuation of tPCB levels in the legacy sediments (i.e., the covering of contaminated sediments with newer, less

contaminated materials, flushing of sediments during periods of high stream flow, and biodegradation). Assuming that the tPCB concentrations in the Upper Chesapeake Bay will continue to decline, at or above the current rate, no additional tPCB reductions will be necessary to meet the “fishing” designated use in the Corsica River embayment.

The tPCB long-term annual average TMDL for the Corsica River of the Lower Chester River, Mesohaline Segment is 756 grams/year. The TMDL represents a 49 percent reduction from the total baseline load of 1,481 grams/year.

IV. Discussion of Regulatory Conditions

EPA finds that MDE has provided sufficient information to meet all seven of the basic requirements for establishing a tPCB TMDL for the Corsica River of the Lower Chester River, Mesohaline Segment. EPA, therefore, approves this tPCB TMDL for the Corsica River of the Lower Chester River, Mesohaline Segment. This approval is outlined below according to the seven regulatory requirements.

1) The TMDLs are designed to implement applicable water quality standards.

Water Quality Standards consist of three components: designated and existing uses; narrative and/or numerical water quality criteria necessary to support those uses; and an anti-degradation Statement. The specific designated use for Corsica River of the Lower Chester River, Mesohaline Segment, is Use II – Support of Estuarine and Marine Aquatic Life and Shellfish Harvesting (COMAR 2007b). The State of Maryland adopted three separate water column tPCB criteria: human health criterion for protection of human health associated with consumption of PCB contaminated fish, as well as fresh and salt water chronic tPCB criteria for protection of aquatic life. The Maryland water column human health tPCB criterion is set at 0.64 nanograms/liter (ng/L, ppt) (COMAR 2007c; US EPA 2006). The Maryland fresh and salt water chronic aquatic life tPCB criteria are set at 14 ng/L and 30 ng/L, respectively (COMAR 2007c; US EPA 2006). A sediment tPCB criterion has not been established within Maryland water quality standards.

The overall objective of the tPCB TMDL is to ensure that the “fishing” designated use in the Corsica River embayment is protected. MDE evaluates PCB water quality conditions with the use of either the tPCB fish tissue listing threshold (39 ng/g) or the Maryland water column human health tPCB criterion (0.64 ng/L). In order to determine which one of these targets is more environmentally protective, the tPCB fish tissue listing threshold was converted to a corresponding tPCB water column concentration. This was done with the use of a site-specific Adjusted Total Bioaccumulation Factor (Adj-tBAF) of 110,784 L/kg following the method of the Tidal Potomac River PCB TMDLs (MDE 2007b). Based on this analysis, the water column tPCB target of 0.35 ng/L, derived from the tPCB fish tissue listing threshold, is more environmentally protective than the Maryland water column human health tPCB criterion of 0.64 ng/L, and therefore was applied as the site-specific tPCB water column TMDL endpoint. Similarly, in order to establish whether levels of PCBs in the sediment are protective of the “fishing” designated use, a site-specific tPCB sediment target for the Corsica River embayment was derived based on the tPCB fish tissue listing threshold. This was done with the use of a site-specific adjusted sediment bioaccumulation factor (Adj-SediBAF) of 4.5 (unitless) following the

method of the Tidal Potomac River PCB TMDLs, resulting in a sediment target of 8.7 ng/g. EPA believes the derived tPCB water column and sediment endpoints are reasonable and appropriate for the development of tPCB TMDLs for the Corsica River of the Lower Chester River, Mesohaline Segment.

2) *The TMDLs include a total allowable load as well as individual wasteload allocations and load allocations.*

Total Allowable Load

As described above, the allowable load was determined by first estimating a baseline load from current monitoring data. The baseline load was estimated using a tidally averaged multi-segment one-dimensional transport model that was applied to simulate the tPCB dynamic interactions between the water column and bottom sediments within the Corsica River embayment and the Chesapeake Bay. The TMDL for tPCB was established after running the model for 20,000 days to predict the time needed for the water column tPCB concentration to meet the site-specific tPCB water column TMDL endpoint. The results indicated that when the site-specific water column TMDL endpoint (0.35 ng/L) was met, the site-specific sediment TMDL endpoint (8.7 ng/g) was met as well. Simulation results showed that after 3,206 days (about 9 years) the tPCB water column concentration reached 0.35 ng/L, at which time the sediment tPCB concentration was equal to 2.1 ng/g. The TMDL load is considered the maximum allowable load the watershed can assimilate and still attain water quality standards. The allowable load was reported in units of grams/year for the average annual load and in grams/day for the long term daily load. Expressing TMDLs using these units is consistent with Federal regulations at 40 CFR §130.2(i), which states that *TMDLs can be expressed in terms of either mass per time, or other appropriate measure*. The average annual and long term daily tPCB TMDLs are presented in Tables 1 and 2, respectively.

EPA regulations at 40 CFR §130.2(i) state *that the total allowable load shall be the sum of individual WLAs for point sources, LAs for nonpoint sources, and natural background concentrations*. The TMDL for tPCB for the Corsica River of the Lower Chester River, Mesohaline Segment is consistent with 40 CFR §130.2(i) because the total loads provided by MDE equal the sum of the individual WLAs for point sources and the land based LAs for nonpoint sources.

Load Allocations

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 the loading. Wherever possible, natural and nonpoint source loadings should be distinguished. As described above, loadings from the Lower Chester River (conveying tPCBs from the Chesapeake Bay), resuspension and diffusion from bottom sediments, are the most significant sources of PCBs to the Corsica River embayment and as such are the only ones requiring reductions in order to meet the “fishing” designated use in the Corsica River embayment. These reductions are expected to take place over time as the Upper Chesapeake Bay concentrations continue to decline resulting also in natural attenuation of tPCB levels in the legacy sediments. The remaining LAs were set as

equivalent to the corresponding baseline loads. Table 7, of the TMDL Report, provides a breakdown of the existing average annual tPCB loads from these source categories.

Wasteload Allocations

As indicated in the TMDL Report, there is one permitted point source regulating the discharge of tPCB in this watershed. This point source is an active municipal NPDES permitted facility WWTP. The WWTP load was considered to be *de minimis*, therefore no appreciable environmental benefit would be gained by reducing this load. Disaggregation of the NPDES stormwater loads in Corsica River watershed is not practical, and for the purposes of this analysis NPDES regulated stormwater tPCB baseline load was not characterized. Instead, this load was included as part of the overall watershed nonpoint source LA.

Federal regulations at 40 CFR §122.44(d)(1)(vii)(B) require that, for an NPDES permit for an individual point source, the effluent limitations must be consistent with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA.

There is no express or implied statutory requirement that effluent limitations in NPDES permits necessarily be expressed in daily terms. The CWA definition of “effluent limitation” is quite broad (effluent limitation is “any restriction ... on quantities, rates, and concentrations of chemical, physical, biological, and other constituents which are discharged from point sources...”). See CWA 502(11). Unlike the CWA’s definition of TMDL, the CWA definition of “effluent limitation” does not contain a “daily” temporal restriction. NPDES permit regulations do not require that effluent limits in permits be expressed as maximum daily limits or even as numeric limitations in all circumstances, and such discretion exists regardless of the time increment chosen to express the TMDL. For further guidance, refer to Benjamin H. Grumbles memo (November 15, 2006) titled *Establishing TMDL Daily Loads in Light of the Decision by the U.S. Court of Appeals for the D.C. Circuit in Friends of the Earth, Inc. v. EPA, et al., No. 05-5015 (April 25, 2006) and implications for NPDES Permits.*

EPA has authority to object to the issuance of an NPDES permit that is inconsistent with WLAs established for that point source. Based on the foregoing, EPA has determined that the TMDLs are consistent with the regulations and requirements of 40 CFR Part 130.

3) The TMDLs consider the impacts of background pollutant contributions.

The TMDLs consider the impact of background pollutants by considering the tPCB loads from sources such as atmospheric deposition and bottom sediments.

4) The TMDLs consider critical environmental conditions.

EPA regulations at 40 CFR §130.7(c)(1) require TMDLs to account for critical conditions for stream flow, loading, and water quality parameters. The intent of the regulations is to ensure that (1) the TMDLs are protective of human health, and (2) the water quality of the waterbodies is protected during the times when they are 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 standards¹. 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 this TMDL, the critical condition was determined to be associated with the long-term exposure of fish to ambient environmental conditions. Total PCB levels in fish become elevated due to long-term exposure, rather than temporary spikes in water column tPCB concentration. The selection of the average tPCB concentrations within each model segments as representing the baseline conditions adequately considers the impact of seasonal variations and critical conditions on the “fishing” designated use in the Corsica River embayment.

5) *The TMDLs consider seasonal environmental variations.*

Seasonality was considered by using the average tPCB concentrations within each model segments as representing the baseline conditions.

6) *The TMDLs include a Margin of Safety.*

The requirement for a MOS is intended to add a level of conservatism to the modeling process in order to account for uncertainty. Based on EPA guidance, the MOS can be achieved through two approaches. One approach is to reserve a portion of the loading capacity as a separate term, and the other approach is to incorporate the MOS as part of the design conditions. MDE adopted an explicit MOS of 10 percent of the TMDL condition (75.6 grams/year).

7) *The TMDLs have been subject to public participation.*

MDE provided an opportunity for public review and comment on the tPCB TMDL for the Corsica River of the Lower Chester, Mesohaline watershed. The public review and comment period was open from July 30, 2009 through August 28, 2009. MDE did not receive any comments.

A letter was sent to the U.S. Fish and Wildlife Service pursuant to Section 7(c) of the Endangered Species Act, requesting the Service’s concurrence with EPA’s findings that approval of this TMDL does not adversely affect any listed endangered and threatened species, and their critical habitats.

V. Discussion of Reasonable Assurance

EPA requires that there be a reasonable assurance that the TMDLs can be implemented. 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

¹ EPA memorandum regarding EPA Actions to Support High Quality TMDLs from Robert H. Wayland III, Director, Office of Wetlands, Oceans, and Watersheds to the Regional Management Division Directors, August 9, 1999.

with the assumptions and requirements of any available WLA for the discharge prepared by the State and approved by EPA. Furthermore, EPA has the authority to object to issuance of an NPDES permit that is inconsistent with WLAs established for the point source.

As discussed above, resuspension and diffusion from the bottom sediments and the Chesapeake Bay tidal influence have been identified as the two major sources of tPCBs to the Corsica embayment. It has been estimated that on average the tPCB concentrations in the Upper Chesapeake Bay are decreasing at a rate of 6.5% per year (Ko and Baker 2004). Given this rate of decline, the tPCB levels in the Corsica River embayment are expected to decline over time due to natural attenuation, such as the burial of contaminated sediments with newer, less contaminated materials, flushing of sediments during periods of high stream flow, and biodegradation.

Also, MDE has stated that discovering and remediating any existing PCB land sources throughout the Upper Chesapeake Bay watershed via future TMDL development and implementation efforts will further help to meet water quality goals in the Corsica River embayment. They will continue to monitor PCB levels in Maryland's fish. This information will be used to evaluate the PCB impairment in the Corsica River embayment on an ongoing basis.

