



Statewide Michigan PCB TMDL

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LIST OF ACRONYMS

AMV	Aquatic Maximum Value
AOC	Area of Concern
ATM	Atmospheric
AUID	Assessment Unit Identification
CERCLA	Comprehensive Environmental Response, Compensation and Liability Act
CFR	Code of Federal Regulations
EDU	Ecological Drainage Unit
FCMP	Fish Contaminant Monitoring Program
FCV	Final Chronic Value
GLRI	Great Lakes Restoration Initiative
g/mol	Grams per Molecule
HCV	Human Cancer Value
HUC	Hydrologic Unit Code
IADN	Integrated Atmospheric Deposition Network
KM	Kilometer
LA	Load Allocation
LC	Loading Capacity
MCGI	Michigan Center for Geographic Information
MDCH	Michigan Department of Community Health
MDEQ	Michigan Department of Environmental Quality
MDNRE	Michigan Department of Natural Resources and Environment
mg/kg	Milligrams per Kilogram
MiSWIM	Michigan Surface Water Information Management System
MOS	Margin of Safety
MRLC	Multi-Resolution Land Characteristic Consortium
MS4	Municipal Separate Storm Sewer System
ng/L	Nanograms per Liter
ng/m ³	Nanograms per Cubic Meter
NHD	National Hydrography Dataset
NOAA	National Oceanic and Atmospheric Administration
NPDES	National Pollutant Discharge Elimination System
NREPA	Natural Resources and Environmental Protection Act
PCB	Polychlorinated biphenyl
POP	Population
PPM	Parts Per Million
RAD	Risk Associated Dose
SRD	Substantive Requirement Documents
TMDL	Total Maximum Daily Load
TSCA	Toxic Substance Control Act
USEPA	United States Environmental Protection Agency
USGS	United States Geological Survey
WLA	Waste Load Allocation
WQBEL	Water Quality-Based Effluent Limitations
WQS	Water Quality Standard
WV	Wildlife Value

1.0 INTRODUCTION

Section 303(d) of the federal Clean Water Act and the United States Environmental Protection Agency's (USEPA) Water Quality Planning and Management Regulations (Title 40 of the Code of Federal Regulations [CFR] Part 130) require states to develop Total Maximum Daily Loads (TMDLs) for all Category 5¹ water bodies that are not meeting Water Quality Standards (WQS) for a specific pollutant. These water bodies are included on a state's Section 303(d) list. The TMDL process establishes the allowable loadings of a pollutant to a water body based on the relationship between pollution sources and water quality conditions of a water body. This allowable loading represents the maximum quantity of a pollutant that the water body can receive without exceeding WQS. The TMDL process provides states with the basis for establishing water quality-based controls, which provide the pollutant reductions necessary for a water body to attain WQS (USEPA, 1991).

The 2010 Sections 303(d), 305(b), and 314 Integrated Report (Michigan Department of Environmental Quality² [MDEQ], 2010a) identified 21,923 miles of rivers and streams and 144,693 acres of inland lakes and reservoirs as not supporting their designated use due to high concentrations of polychlorinated biphenyls (PCBs) in fish tissue. In addition, 49,551 miles of rivers and streams and 125 acres of lakes are not supporting their designated use due to PCBs in the water column (MDEQ, 2010a).

The scope of this PCB TMDL covers inland water bodies in the state of Michigan, primarily impacted by atmospheric deposition of PCBs. These water bodies are described further in Section 2 and Appendix A. This document describes the statewide approach that Michigan has taken to develop a TMDL for PCBs. The report covers each step of the TMDL process and is organized as follows:

- Section 2: Background
- Section 3: Applicable WQS and Numeric Targets
- Section 4: Modeling Approach
- Section 5: Source Assessment
- Section 6: TMDL Development
- Section 7: Reasonable Assurance and Implementation
- Section 8: Post-TMDL Monitoring

¹ Category 5 means available data and/or information indicate that at least one designated use is not being supported or is threatened, and a TMDL is needed (MDEQ, 2010a).

² For a short period of time (October 2009-March 2011) the MDEQ was reorganized and known as the Michigan Department of Natural Resources and Environment (MDNRE). For consistency, MDEQ is used throughout this document when referencing the agency.

2.0 BACKGROUND

This section provides background information for PCB TMDL development. It is divided into the following subsections:

- Problem Statement
- Data Collection and Assessment of Water Quality
- Scope of Water Bodies Considered Under this TMDL

2.1 PROBLEM STATEMENT

PCBs are a class of synthetic, chlorinated organic chemicals produced mainly for their excellent insulating capabilities and chemical stability. They were produced in the form of complex mixtures for industrial use in the United States from 1929 to 1977, mostly by the Company, Monsanto, which produced approximately 640,000 tons. Peak production occurred in 1970, and over half of total United States production occurred between 1960 and 1974 (de Voogt and Brinkman, 1989). Production is difficult to estimate because there were 209 congeners, 9 homologs, many technical mixtures, and many different trade names used throughout the production period (e.g., Aroclor, Askarel, Inerteen). PCBs were used in the United States for a number of applications, but primarily consisted of closed system and heat transfer fluids (transformers, capacitors, fluorescent light ballasts, etc.; 60 percent), plasticizers (25 percent), hydraulic fluids and lubricants (10 percent), and other uses (5 percent) (Keeler et al., 1993). A major use in Michigan for PCBs was in the production of recycled carbonless copy paper. The National Cash Register Company purchased a specific mixture of PCBs (Aroclor 1242) from Monsanto to be used as an ink carrier or solvent between 1957 and 1971. The solvent was also licensed for use to several other paper manufacturers in the Great Lakes region. The total use of PCBs for this purpose was about 28 percent of total plasticizer use and just over 6 percent of total Monsanto sales for the time period 1957 to 1971 (USEPA, 1977).

The USEPA banned production of PCBs in 1979 due to their toxic properties, and this class of chemicals was ultimately phased out of new uses in 1983. PCBs have been shown to cause a variety of adverse health effects, notably cancer in animals. Non-cancer effects include impacts to the nervous, immune, reproductive, and endocrine systems, among other adverse effects (USEPA, 2004). PCBs are relatively persistent (i.e., do not readily degrade) and hydrophobic; consequently the higher chlorinated congeners tend to accumulate in suspended and bottom sediments of aquatic systems. Also, PCBs hydrophobicity means they generally have low water solubility and high solubility in most organic solvents, oils, and fats. Therefore, PCBs concentrate in the fatty tissues of organisms and bioaccumulate in living tissues. Thus, despite the United States ban of PCB production, PCBs remain in the environment in soil, water, air, animal tissue, and vegetation. Because the industrial use of PCBs has been banned, the primary sources of PCBs to water likely are historical sediment contamination and ongoing atmospheric deposition (MDEQ, 2010a).

2.1.1 TMDL Development Process

Because of the widespread impairment of Michigan's waters due to PCBs, a statewide TMDL has been developed for inland waters primarily impacted by atmospheric deposition of PCBs, by providing the pollutant reductions necessary to attain WQS.

Considerations used to prioritize TMDL development include the existing TMDL schedule (i.e., the number of TMDLs currently scheduled for each year), Michigan's five-year rotating watershed monitoring cycle (Figure 1), available staff and monetary resources to complete TMDLs, data and supporting information on quality and quantity of the pollutant causing the impairment, complexity of the problem and severity of the pollution, and the USEPA's recommendation to develop TMDLs within 13 years of listing (MDEQ, 2010a).

A scheduled completion date for TMDLs to address PCB impairment of inland water bodies was proposed for 2013 in the 2010 Integrated Report. Great Lakes and connecting channels are currently scheduled for TMDL development in 2015 (MDEQ, 2010a).

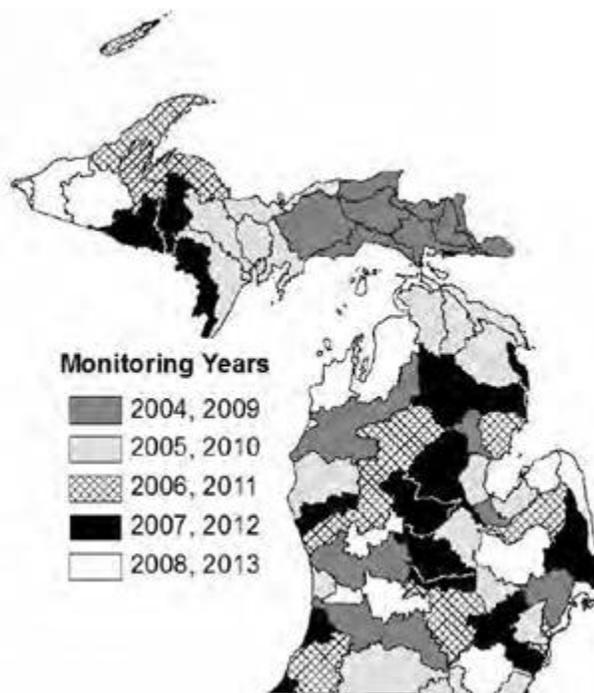


Figure 1. MDEQ's Five-year Rotating Watershed Monitoring Cycle.
(Source: MDEQ, 2008)

2.1.2 Recent PCB Trends

Overall, PCB concentrations in fish tissue and air are decreasing across Michigan. Trend analyses have been conducted on datasets for fish collected from inland water bodies at an interval of two to five years for Michigan's whole fish trend monitoring program (i.e., MDEQ Fish Contaminant Monitoring Program [FCMP]). These data include carp from five inland rivers, and lake trout, walleye, or largemouth bass from eight inland lakes. From 1990 to 2007, PCB concentrations in whole body fish samples from all 13 inland water bodies showed a statistically significant decrease, with an average annual decrease rate of 7.1 percent (Table 1; MDEQ, 2008).³

³ Fish tissue PCB concentrations for whole fish were not used to calculate the PCB TMDL.

Table 1. Annual Rates of Change in Fish Tissue PCB Concentrations for Whole Fish Collected from Fixed Station Trend Monitoring Stations. (Source: MDEQ, 2008)

Water Body	Species	Rate of Change (%)	P Value
<i>Inland Rivers</i>			
Grand River	Carp	-3.1	<0.005
Kalamazoo River	Carp	-7.2	<0.001
Muskegon River	Carp	-13.4	<0.001
River Raisin	Carp	-14.1	<0.001
St. Joseph River	Carp	-2.9	<0.05
<i>Inland Lakes</i>			
Grand Sable Lake	Lake Trout	9.1	<0.001
Lake Gogebic	Walleye	-15.9	<0.001
South Manistique Lake	Walleye	-4.3	<0.001
Higgins Lake	Lake Trout	-10.3	<0.001
Houghton Lake	Largemouth Bass	-12.1	<0.001
Gull Lake	Largemouth Bass	-6.4	<0.001
Gun Lake	Largemouth Bass	-6.3	<0.001
Pontiac Lake	Largemouth Bass	-6.0	<0.005
Average		-7.1	
Median		-6.4	

Air concentrations of PCBs measured by the Integrated Atmospheric Deposition Network (IADN) also showed a general decrease from 1992 through 2002 (USEPA, 2012; Environment Canada and USEPA, 2000 and 2005; Figure 2).

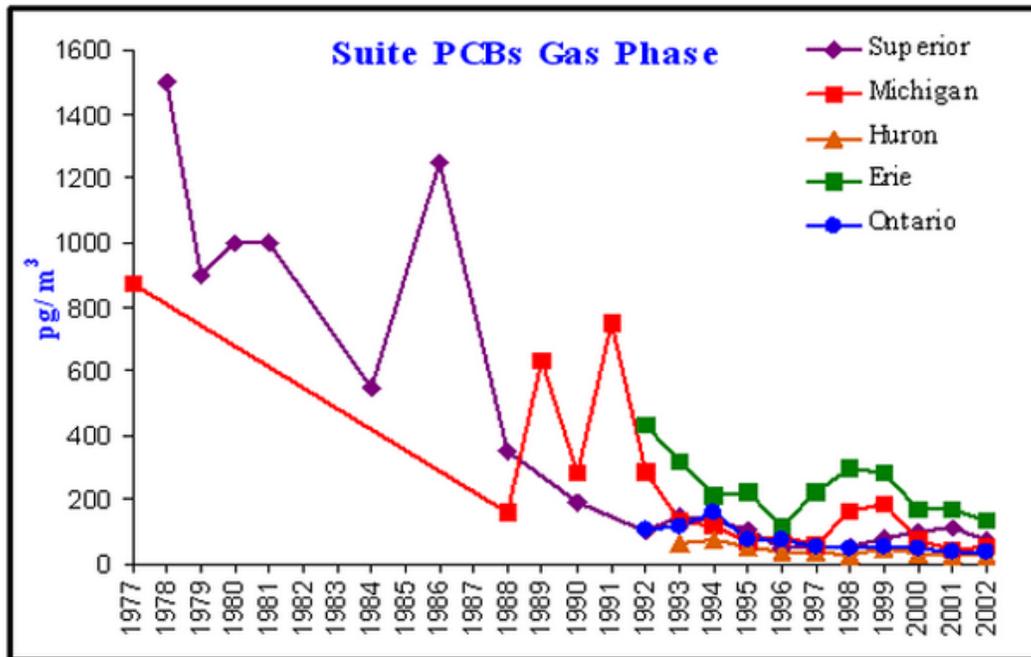


Figure 2. Time Trend of PCB Gas Phase Atmospheric Concentrations at Great Lakes IADN Stations. (Source: USEPA, 2012)

2.2 DATA COLLECTION AND ASSESSMENT OF WATER QUALITY

TMDLs must be developed for all water bodies contained on a states's Section 303(d) list. This section begins with a discussion of the state's data collection efforts used to support impairment determination, follows with a summary of waters impaired by PCBs, and concludes with a discussion of the scope of water bodies considered under this TMDL.

2.2.1 Data Collection and Summary Analysis

Michigan uses the National Hydrography Dataset (NHD) to organize and identify water bodies for the Section 303(d) list. A base assessment unit is a 12-digit hydrologic unit code (HUC), which may be split further into smaller assessment units depending on information such as land use, known areas of contamination, specific fish consumption advisories, physical barriers such as dams, etc. Each assessment unit is assigned an assessment unit identification (AUID) number and may consist of all water bodies in a 12-digit HUC (as a maximum) or specific stream segments or lakes located in that HUC (MDEQ, 2010a).

Water column samples analyzed for PCBs are stored within the MDEQ Michigan Surface Water Information Management System (MiSWIM)⁴. PCBs were collected as part of the Water Chemistry Monitoring Program from the initiation of the program in 1998 through 2007. The goal of the sampling was to determine if PCBs were ubiquitous in Michigan. While concentrations varied widely, PCBs were present in all samples and only met the WQS of 0.026 nanograms per liter (ng/L) on one occasion (MDEQ, 2013). PCB water column concentrations ranged from 0.026 to 256 ng/L. PCB water column data are no longer collected due to the high cost of analyzing water samples, the knowledge that almost all waters exceed

⁴ Available on the MDEQ's Web site at <http://www.michigan.gov/miswim/>.

the WQS, and because PCBs can be monitored accurately using fish tissue samples at a more reasonable cost.

Fish tissue samples are collected by a variety of agencies to provide data for assessment purposes as part of the FCMP. These agencies include, but are not limited to, the Michigan Department of Natural Resources, Fisheries Division; United States Fish and Wildlife Service, MDEQ, and tribal agencies. There are two major components of the FCMP: the edible portion monitoring program and the whole fish trend monitoring program. The edible portion program is used to make impairment determinations due to PCBs in fish tissue, since the primary objective of the edible-portion monitoring program is focused on developing sport fish consumption advisories and commercial fishing restrictions (Exponent, 2003). PCB concentrations in tissue are available from the FCMP for over 20 species collected between 1990 and 2009. The average statewide PCB concentration in edible portions of fish is 0.235 milligrams per kilogram (mg/kg), and exceeds the TMDL fish tissue target of 0.023 mg/kg for most of the species for the period 2000-2009 (Table 2). Because PCB concentrations in water and fish tissue have been declining since the early 1990s, it was determined that PCB data older than ten years starting from the 2010 Integrated Report would not be included in the evaluation of fish tissue data. In addition, total PCB concentrations in fish tissue prior to 2000 were analyzed as Aroclors but are now reported as total congeners. Therefore, fish tissue PCB data collected as part of the FCMP were summarized for the period 2000-2009 and used in the development of this TMDL.

It should be noted that different data periods are intentionally used for: (1) making an impairment determination; and (2) developing the TMDL. In general, PCB concentrations in air and fish are decreasing over time. This general knowledge is insufficient to remove a specific water body from the impaired waters list, as explicit demonstration of attainment is required to delist a water body. TMDL development, on the other hand, requires use of the most representative recent data to define the relationship between atmospheric concentration and fish tissue concentrations. For that reason, it is appropriate to use a more recent subset of the data for TMDL development than for impairment determination. An explanation of the development of the TMDL target for fish tissue can be found in Section 3.

Table 2. Average PCB Fish Tissue Concentration for Edible Portion of Fish Collected through FCMP 2000-2009. Results in bold exceed the TMDL target (0.023 mg/kg).

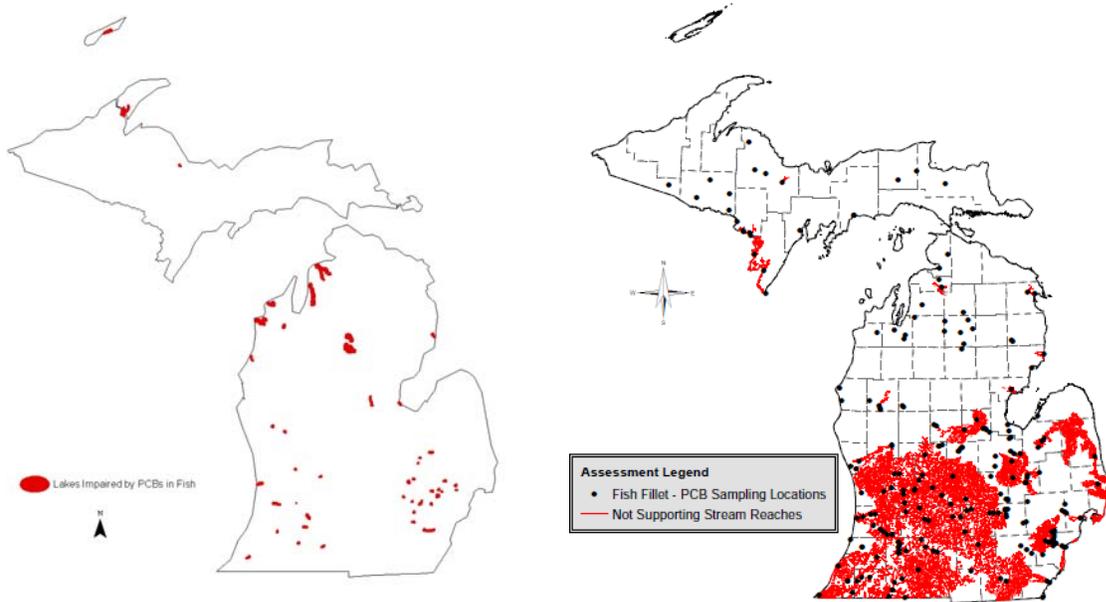
Species	Number of Samples	Average Concentration (mg/kg) ¹
Black Crappie	50	0.073
Brook Trout	12	0.072
Brown Bullhead	112	0.006
Brown Trout	40	0.159
Carp	733	0.641
Channel Catfish	120	0.260
Freshwater Drum	10	0.267
Lake Herring	5	0.001
Lake Trout	86	0.147
Lake Whitefish	20	0.058
Largemouth Bass	330	0.034
Northern Pike	331	0.058
Pumpkinseed	9	0.060
Rainbow Trout	20	0.020
Redhorse Sucker	129	0.091
Rock Bass	162	0.102
Smallmouth Bass	187	0.106
Splake	20	0.004
Walleye	316	0.125
White Bass	20	1.106
White Sucker	359	0.179
Yellow Bullhead	27	0.003
Yellow Perch	34	0.026
Total	3132	0.235

¹All data collected from inland water bodies in Michigan are included in this table, including samples from sites influenced by the Great Lakes and/or legacy sources of PCBs. Concentrations are the average result for the number of samples collected per fish species.

2.2.2 Discussion of Section 303(d) Listings

The MDEQ used the data described in Section 2.2.1 to define all water bodies in the state that are impaired by PCBs. Based on a total of 3,217 AUIDs (composed of inland lakes, streams, and river segments), 2,515 AUIDs are defined as impaired: 1,141 AUIDs are impaired due to PCBs in fish tissue (Figure 3) and 2,137 AUIDs are impaired due to water column concentrations exceeding the ambient WQS for PCBs (Figure 4). Figure 3 shows lakes, rivers, and streams impairments; however, Figure 4 only shows rivers and streams impairments due to a lack of lake data. Many AUIDs are listed as impaired due to exceedances of both the fish

tissue advisory trigger levels and ambient water column WQS. A detailed discussion of the methodology used for assessing the fish consumption designated use can be found in Section 3.1.5.



a) Impaired Lakes

b) Impaired Rivers and Streams

Figure 3. Impaired Lakes (a) Rivers and Streams (b) Based on Fish Tissue PCB Data. (Data Source: MDEQ, 2010a)

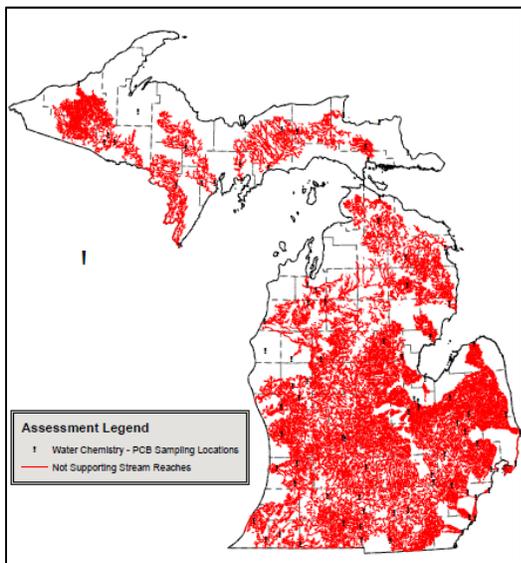


Figure 4. Impaired Rivers and Streams Based on Water Column PCB Data. (Data Source: MDEQ, 2010a)

2.3 SCOPE OF WATER BODIES CONSIDERED UNDER THIS TMDL

As discussed in Section 2.1, the 2010 Integrated Report proposed a schedule for completion of TMDLs to address PCB impairment of inland water bodies, Great Lakes, and connecting channels (MDEQ, 2010a). The state of Michigan's plan for addressing waters impaired by PCBs is summarized below:

1. All of the inland water bodies of the state that were listed as impaired by PCBs were considered under this TMDL using an approach that will be discussed in Section 4 of this TMDL. The MDEQ (2010a) lists 2013 as the target date for submittal of the PCB TMDL addressing inland waters. All but a few of the waters that were considered are expected to meet WQS after implementing source reductions, based on the fish tissue target detailed in Section 3 of this TMDL.
2. PCB contamination in the Great Lakes will take longer to respond when compared to inland water bodies. The Great Lakes, connecting channels, and waters influenced by the Great Lakes will benefit from the atmospheric reductions called for in this TMDL; however, these water bodies will also require a Great Lakes TMDL, scheduled for development in 2015. Additional impacts not accounted for by the atmospheric component of this inland water body TMDL will be better understood and reflected during the development of the Great Lakes TMDL.
3. Water bodies influenced primarily by known legacy sources of PCBs were considered in the analysis used in this TMDL. A few inland water bodies impaired primarily by known legacy sources of PCBs are predicted to not achieve WQS from reductions in atmospheric loading. Sites with legacy sources, including those with cleanup plans, will be studied further to determine appropriate actions to address the PCB impairment.

A list of water bodies submitted for approval under this TMDL is included in Appendix A.

3.0 APPLICABLE WQS AND NUMERIC TARGETS

This section describes applicable WQS and target selection for this PCB TMDL. It consists of the following sections:

- WQS
- Numeric TMDL Target
- Applying the Numeric TMDL Target

3.1 WATER QUALITY STANDARDS

WQS are comprised of the designated uses of the water body, water quality criteria to protect designated uses, and an anti-degradation policy to maintain and protect existing uses and high quality waters.

3.1.1 Designated Uses

The Clean Water Act Section 303(c)(2)(A) requires states to identify appropriate water uses for all water bodies, and provide, where attainable, water quality (in the form of WQS) for the protection and propagation of fish, shellfish, and wildlife, and recreation in and on the water. Designated uses describe the various uses of waters that are considered desirable, and identify those waters that should be protected. At a minimum, all surface waters in Michigan are designated and protected for all of the following uses: agriculture, navigation, industrial water supply, warm water fishery, other indigenous aquatic life and wildlife, partial body contact recreation, total body contact recreation (May 1 to October 31) and fish consumption. A select group of rivers and inland lakes, in addition to the Great Lakes and select connecting channels are designated and protected for coldwater fisheries and public water supply (R 323.1100, Designated Uses, of the Part 4 rules, WQS, promulgated under Part 31, Water Resources Protection, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended [NREPA]).⁵

3.1.2 Water Quality Criteria

Water quality criteria can be expressed in either a numeric or narrative form. These are described below for PCBs.

3.1.2.1 Numeric Criteria

Two numeric water quality criteria exist for PCBs. The Wildlife Value (WV), 0.12 ng/L, is used to assess whether the wildlife component of the indigenous aquatic life and wildlife designated use is being protected (MDEQ, 2011). The WV is the maximum ambient water concentration of a substance at which adverse effects are not likely to result in population-level impacts to mammalian and avian wildlife populations from lifetime exposure through drinking water, and an aquatic food supply, using the methodology specified in R 323.1057(3) of the Part 4 Rules. The Human Cancer Value (HCV), 0.026 ng/L for PCBs, is used to assess whether the fish consumption designated use is being protected (MDEQ, 2011). The HCV is the maximum ambient water concentration of a substance at which a lifetime of exposure from either drinking the water, consuming fish from the water, or conducting water-related recreation activities will

⁵ See http://michigan.gov/documents/deq/wb-sw-as-rules-part4_254149_7.pdf.

represent a plausible upper bound risk of contracting cancer of 1 in 100,000 using the exposure assumptions and methodology specified in R 323.1057(4) of the Part 4 WQS.

3.1.2.2 Narrative Criteria

R 323.1057(1) states, “Toxic substances shall not be present in the surface waters of the state at levels that are or may become injurious to the public health, safety, or welfare, plant and animal life, or the designated uses of the waters.” Since the presence of fish consumption advisories in the state implies that the fish consumption designated use is not being met, it was considered appropriate to use a fish tissue target to interpret the narrative standard (USEPA, 2011). The methodology used to derive the fish tissue residue value used as the target for the TMDL is described in Section 3.2 of this report.

3.1.3 Designated Use Support

Every two years, the state of Michigan evaluates the extent to which waters of the state are attaining their designated uses. The principle of independent applicability is used when making a support determination for each water body. For example, if data for more than one parameter are available (i.e., water column and fish tissue concentrations), and both are used to determine support for the same designated use, then each data type is evaluated independently to determine support for the designated use. If either data type indicates that the designated use is not supported, then the water body is normally listed as not supporting the designated use (MDEQ, 2010a). Many of Michigan’s surface waters are impaired due to PCBs and consequently, do not support the other indigenous aquatic life and wildlife designated use and/or the fish consumption designated use (MDEQ, 2010a). These are the impaired designated uses addressed by this TMDL.

Michigan uses multiple assessment types and parameters to determine indigenous aquatic life and wildlife designated use support and fish consumption designated use support. Water column concentrations are used to assess support of the other indigenous aquatic life and wildlife designated use. Data considered for the assessment of the fish consumption use include the concentration of PCBs in the water column, and fish consumption advisories issued by the Michigan Department of Community Health (MDCH) (MDEQ, 2010a). A description of the methodology used to assess whether a designated use is impaired can be found in the sections that follow.

3.1.4 Methodology Used to Assess Other Indigenous Aquatic Life and Wildlife Use Support

Support of the other indigenous aquatic life and wildlife designated use is assessed by comparing ambient water column chemical concentrations to the WV, Aquatic Maximum Value (AMV), and the Final Chronic Value (FCV) (R 323.1057). A WV of 0.12 ng/L has been derived for PCBs, but there were insufficient data available to derive aquatic life criteria for PCBs. However, it was concluded that the lowest of the chronic standards, the HCV of 0.026 ng/L, would be protective of long-term exposure of aquatic life to PCBs. The geometric mean of the water column samples collected over one year is compared to the HCV, since it is the lowest and therefore most conservative value for determining indigenous aquatic life and wildlife designated use support (MDEQ, 2010a).

3.1.5 Methodology Used for Assessing Fish Consumption Use Support

Water chemistry (i.e., water column samples) and other public health guidance (i.e., fish consumption advisories) are used to determine support of the fish consumption designated use. In terms of water chemistry, the ambient water column PCB concentration is compared to the HCV (MDEQ, 2010a). Water bodies with one or more ambient water column PCB samples that are greater than the HCV are determined to not support the fish consumption designated use. If no samples are collected in a watershed or water body, that segment (AUID) is considered to be unassessed. The use of one ambient water column sample to determine designated use support is justified by the existence of a large water column PCB dataset for the state as a whole, which shows virtually 100 percent exceedance of the HCV for total PCBs in water (MDEQ, 2010a). It should be noted that water samples are no longer analyzed for PCBs as part of the statewide Water Chemistry Monitoring Program, due to the high cost of analyzing water samples, knowledge that almost all water samples exceed WQS, and because PCBs can be monitored accurately using fish tissue samples at a more reasonable cost.

A fish consumption advisory issued by the MDCH is also used to determine support for the fish consumption designated use (MDEQ, 2010b). Regardless of whether there are water samples, the MDCH bases fish consumption advisories strictly on edible fish tissue (fillet) data. Fish are collected statewide by the MDEQ and other agencies for tissue analysis as part of the FCMP. The results of the analyses of these fish are used by the MDCH to determine issuance of fish consumption advisories. The MDCH uses the United States Food and Drug Administration's 2.0 parts per million (ppm) (or mg/kg) trigger level for total PCB concentrations when developing advisories for the general population (Table 3). In addition to general population advisories, the MDCH advises women of child-bearing years, and children under 15 years of age, to eat no more than one meal per week if total median PCB concentrations exceed 0.05 ppm (or mg/kg), and no more than 1 meal per month if total PCB concentrations exceed 0.2 ppm (Table 3) (MDEQ, 2010b). Even though the MDCH fish tissue PCB value is not an ambient WQS, the MDEQ uses the MDCH fish consumption advisories when determining support of the fish consumption designated use. If the MDCH has issued a site-specific fish consumption advisory for a water body, that water body is considered by the MDEQ to not support the fish consumption designated use.

Table 3. Trigger Levels Used by the MDCH to Establish Fish Consumption Advisories⁶.
(Source: MDEQ, 2010b)

Group	Consumption Level	MDCH Trigger Level (Total PCB, ppm)
General Population	1 Meal Per Week	2.0
Women of Child-bearing Age and Children Under 15 Years	1 Meal Per Week	0.05
	1 Meal Per Month	0.2
	6 Meals Per Year	1.0
	No Consumption	1.9

⁶ For additional information see: http://www.michigan.gov/documents/deq/wrd-sw-as-fcmp-2010report_361228_7.pdf. These values are expected to change in 2013.

3.2 NUMERIC TMDL TARGET

TMDLs are established at a level that attains and maintains the applicable WQS, including designated uses, numeric and narrative criteria, and antidegradation policy (40 CFR §130.7[c][1]). TMDL submittals must include a description of any applicable WQS, and must also identify numeric water quality targets, which are quantitative values used to measure whether or not applicable WQS are being attained. Depending on the designated use being addressed by the TMDL, the criteria used for setting a TMDL target may include human health, aquatic life, and wildlife criteria (USEPA, 2011). Where possible, the water quality criterion for the pollutant causing impairment is used as the numeric water quality target when developing the TMDL. Michigan's WQS include ambient water column numeric criteria for PCBs, but do not contain a fish tissue numeric criterion. As stated previously, Michigan's narrative portion of R 323.1057(1) states, "toxic substances shall not be present in the surface waters of the state at levels that are or may become injurious to the public health, safety, or welfare, plant and animal life, or the designated uses of the waters." The presence of fish consumption advisories justifies the use of a fish tissue target to interpret this narrative standard (USEPA, 2011). **Therefore, a fish tissue residue value is recommended as the target for the statewide PCB TMDL, since the consumption of fish by humans and wildlife is the most significant route of exposure.**

A fish tissue residue value of 0.023 mg/kg (wet weight) in edible fish portions was derived using the same Risk Associated Dose (RAD) (0.000005 mg/kg/day), body weight (70 kg), and fish consumption rate (0.015 kg/d) that was used to derive the HCV for PCBs. A RAD is defined as a dose of a known or presumed carcinogenic substance, in mg/kg/day, that, over a lifetime of exposure, is estimated to be associated with a plausible upper bound incremental cancer risk equal to 1 in 100,000. The fish tissue residue value of 0.023 mg/kg is therefore consistent with the WQS because they both use the same toxicity endpoint and fish consumption rate.

To verify that a fish tissue residue value would be consistent with the WQS for PCBs, the calculation of a resulting water concentration based on the fish tissue residue value of 0.023 mg/kg was made. A trophic level 4 bioaccumulation factor of 1,086,000 liters/kg, used in the calculation of the HCV for PCBs, was used to estimate a water concentration that would be associated with the trophic level 4 fish tissue residue value of 0.023 mg/kg. The resulting water concentration value (0.021 ng/L) was calculated to be lower than the WQS (0.026 ng/L) for PCBs, indicating that the fish tissue residue value would be consistent with the WQS.

3.3 APPLYING THE NUMERIC TMDL TARGET

The selection of a numeric fish tissue target requires the selection of a fish tissue residue value, an appropriate fish species, and a statistical level at which to base compliance with the TMDL once reductions of environmental PCB concentrations have been made. Load reductions in PCBs required by the TMDL will be based on the decrease of PCB concentrations in fish tissue that is necessary to meet a fish tissue residue value of 0.023 mg/kg in the 90th percentile of an appropriate fish species. Achieving the target level for the 90th percentile of the most impacted fish species ensures that the overwhelming majority of species in lower trophic levels will meet the target level.

Because the PCB TMDL is applied statewide and considers a wide range of fish tissue concentrations, it would not be practical to base TMDL reductions on the requirement that every fish in the state be in compliance with the fish tissue residue value of 0.023 mg/kg. A recommended approach is to base reductions in PCB concentrations in fish tissue on an

appropriate level of protection. The 90th percentile has been deemed to provide an appropriate level of protection for the PCB TMDL, since 90 percent of the waters in the state would have a lower proportionality constant than the threshold value. Ninety percent of the waters of the state containing a top predator species with high bioaccumulation potential would be expected to attain WQS after the TMDL is implemented.

Several criteria for selecting a fish species on which to base PCB reductions were evaluated. Calculation of the load reduction necessary to attain the fish tissue residue value in the 90th percentile of water bodies in the state requires a sufficient number of samples. In order for fish tissue data for a selected fish species to be considered representative, the data must have been collected during a time period deemed to be representative of the baseline year of the TMDL. Because PCB concentrations in water and fish tissue have been declining since the early 1990s, it was determined that PCB data older than ten years would not be included in the evaluation of fish tissue data. In addition, total PCB concentrations in fish tissue prior to 2000 were analyzed as Aroclors. After this time period, total PCBs were analyzed and summed as individual PCB congeners. Therefore, fish tissue PCB data collected as part of the FCMP were summarized for the period 2000-2009 (Table 2 in Section 2.2.1). Fish tissue PCB data after 2009 were not available when the data were being compiled for the development of the TMDL.



Figure 5. Photo of a Lake Trout.
Photo Credit: Dan Rockafellow and Dick Mikula.

Based on a review of available fish tissue PCB data, lake trout (*Salvelinus namaycush*) (Figure 5) were used to determine PCB load reductions, and resulting compliance with the TMDL. Lake trout were selected because they have the second highest concentration of PCBs (when sites with legacy PCB sources and/or Great Lakes influence are excluded from the assessment), they are a native species, a trophic level 4 fish, and a preferred sport fish species in Michigan. Furthermore, since the WQS for the protection of human health assume that the majority (76 percent) of the fish consumed by humans are from trophic level 4, it was considered appropriate to apply the fish tissue target residue value to a trophic level 4 fish.

Lake trout PCB data are only available from a limited number of water bodies so it was necessary to verify that lake trout is an appropriate species on which to base compliance with the PCB TMDL. The ability of lake trout to predict compliance with the TMDL target in water bodies where lake trout are not found was assessed and is summarized in Section 4.5.2.

4.0 MODELING APPROACH

This section describes the modeling approach for calculating the PCB TMDL. It consists of the following sections:

- Estimating Atmospheric PCB Loading
- Relating Atmospheric Loading to Fish Tissue Concentration (Principle of Proportionality)
- Atmospheric PCB Concentrations
- Regionalization
- Threshold Proportionality Constant
- Required Reduction Percentage

4.1 ESTIMATING ATMOSPHERIC PCB LOADING

The goal of a TMDL is to define the maximum allowable loading for the pollutant of concern that will result in attainment of applicable WQS, including designated uses. In some cases, it is not feasible to directly estimate or measure the actual pollutant load, and a surrogate measure is used to indirectly represent that load (USEPA, 2002). The atmospheric gas phase concentration of total PCBs is being used as a direct surrogate for PCB loading to surface waters from atmospheric sources for this TMDL because the technology required to precisely measure loadings at the water/air interface does not exist. There are several lines of evidence that provide a scientific justification for using atmospheric gas phase PCB concentrations as a surrogate for atmospheric loading.

First, the gas phase is by far the largest source (or pathway) by which PCBs enter surface water. As a semi-volatile persistent organic chemical group, atmospheric deposition of PCBs to surface waters can take place via three mechanisms:

1. Absorption of gas phase PCBs into the water body by diffusion across the air-water interface and dissolution into a dissolved phase in the water (gas exchange)
2. Washout of atmospheric PCBs during precipitation (wet deposition)
3. Deposition of particulate phase atmospheric PCBs into surface waters by atmospheric mixing processes (for very fine particles that are not heavy enough to be deposited by gravity alone) or gravity settling (dry deposition)

Any of these mechanisms can also deliver PCBs to the land and vegetation in a watershed followed by a series of complex hydrologic processes that may deliver water and potentially associated PCBs to the receiving water body. There is an extensive body of literature containing research and observations of all three of these mechanisms for the Great Lakes region. This body of literature identifies gas phase absorption (mechanism 1 above) as the major source pathway of PCBs to surface waters (e.g., Swackhamer and Armstrong, 1986; Sweet et al., 1993; Jeremiason et al., 1994; Pearson et al., 1996; Hoff et al., 1996; Green et al., 2000; Buehler and Hites, 2002; Blanchard et al., 2008). The primary reason for this finding is that measurements of different forms of PCBs in the atmosphere indicate that ≥ 90 percent of the PCBs in the air are in the gas phase rather than sorbed to aerosols or water droplets (Cotham and Bidleman, 1995; Chen et al., 1996; Simcik et al., 1998).

The portion of total atmospheric PCB loadings (or flux) due to wet deposition is small (Hillery et al., 1998; Blanchard et al., 2008). In general, the absorption depositional fluxes (loadings)

are an order of magnitude higher than the wet deposition fluxes, as exemplified for two urban sites in Figure 6. Dry deposition flux is even smaller than wet deposition flux.

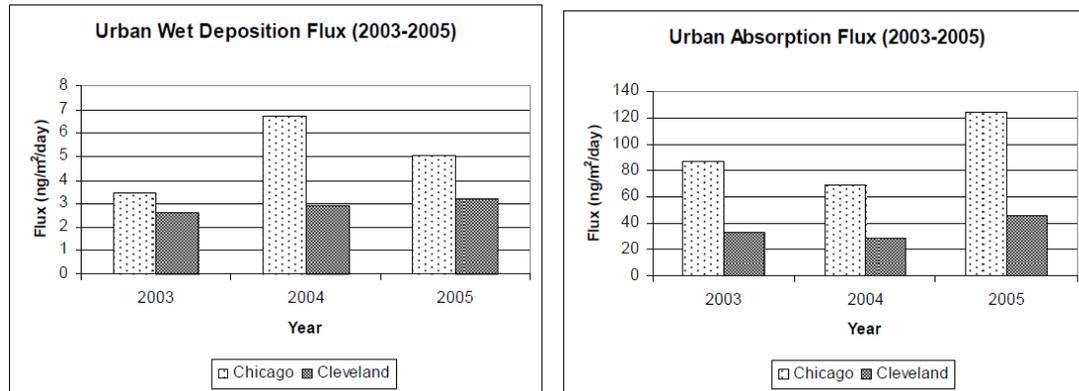


Figure 5. Wet and Absorption Deposition Fluxes of PCBs at Urban Sites. (Source: Blanchard et al., 2008)

Second, the gas phase acts similarly to other phases such as wet deposition. Washout in precipitation (rain and snow) can also be important (Simcik et al., 2000); but because washout deposition rates are dependent on partitioning from the gas phase into the liquid phase in the atmosphere, this deposition mechanism is also driven by the atmospheric gas phase concentration. Simcik et al. (2000) found that the half-lives of PCB precipitation-related deposition in the Great Lakes are not significantly different from the corresponding atmospheric gas phase decline half-lives.

Third, and the most compelling justification for using atmospheric gas phase concentration of total PCBs as a measure of atmospheric deposition, is the Great Lakes IADN and its various monitoring and research outputs (Buehler and Hites, 2002). IADN is a joint United States-Canada venture, required under the 1990 Clean Air Act to measure atmospheric deposition of chemicals of concern throughout the Great Lakes basin, including PCBs. The network consists of five Master Stations and several Satellite Stations for which IADN collects gas and particle air samples for 24 hours every 12 days using high-volume air samplers (Figure 7). Precipitation samples are taken for every rain and snow event and composited for 14 (Canada) or 28 days (United States) for analysis. The IADN data were used to develop the population and temperature-based gas phase PCB relationship that is being used to provide spatial and temporal atmospheric PCB concentration trends in the state of Michigan (Venier and Hites, 2010a).

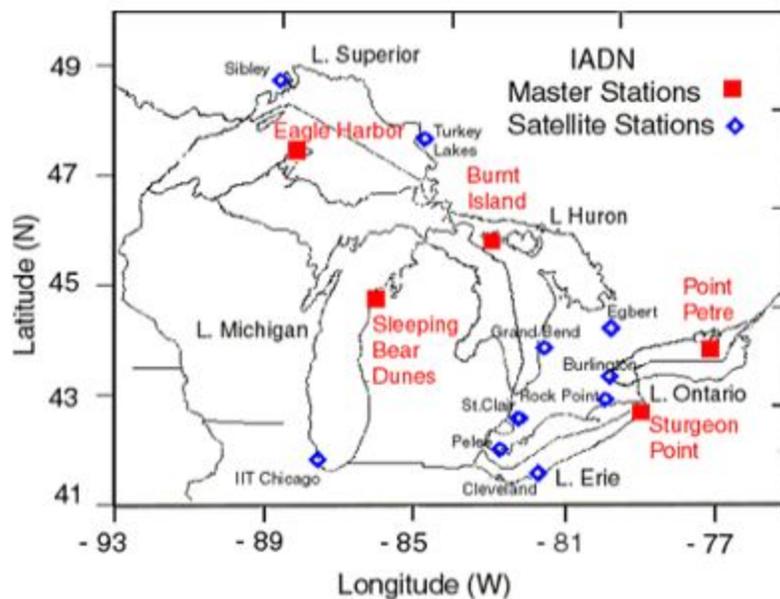


Figure 6. IADN Stations (Brule River not pictured).
(Source: Environment Canada and USEPA ,2012).

IADN also uses its data, supplemented with other data from surface water programs, to compute atmospheric deposition of chemicals of concern to the Great Lakes. Loadings of atmospheric deposition (L , in kg/yr) is calculated using the following equation that includes three processes: wet deposition, dry deposition, and net gas exchange (Blanchard et al., 2008):

$$L = C_p R_p A + C_a \phi_a v_d A + [k_{ol}(1 - \phi_a)C_a(RT/H)A - k_{ol}(1 - \phi_w)C_w A]$$

Atmospheric Deposition = Wet Deposition + Dry Deposition + Gas Phase Absorption – Volatilization (1)

The first term in the equation, wet deposition, is the product of the volume-weighted mean precipitation concentration, C_p (kg/m^3), the rate of precipitation, R_p (m/yr), and the area of the lake, A (m^2). The second term represents dry deposition, and is the product of the total atmospheric concentration of the pollutant, C_a (kg/m^3), obtained from measurements collected at the five master IADN stations (Figure 7), the fraction of the compound in the particle phase, ϕ_a , the deposition velocity of the particles, v_d (m/yr), which is represented as 0.2 cm/s for all chemicals, and the area of the lake, A (m^2).

The last term in the equation represents net gas exchange, and is divided into two components: absorption and volatilization. Absorption is the transfer of the compound in the gas phase from air to water. The variable, k_{ol} (m/yr) is the overall air-water mass transfer coefficient, R ($\text{atm m}^3/\text{K}/\text{mol}$) is the ideal gas constant, T (K) is the temperature at the air-water interface, H ($\text{mol}/\text{atm}/\text{m}^3$) is the Henry's Law constant, C_w (kg/m^3) is the concentration of the compound in water, and A (m^2) is the area of the lake. For absorption, $(1 - \phi_a)C_a$ is the air concentration of the compound in the gas phase. In the volatilization term, ϕ_w is the fraction of the compound on the particle phase in the water, thus making $(1 - \phi_w)C_w$ the dissolved phase concentration of the compound of interest. Volatilization can then be assumed to be the compound transferred from water to air.

The complete term of net gas exchange is the sum of the absorption and volatilization estimates. Positive net gas exchange indicates net absorption of the chemical from air to water, while negative net gas exchange indicates net volatilization from water to air. Gross atmospheric deposition (i.e., the sum of the three processes listed initially in this discussion) is computed with the above equation, but without the volatilization term at the end (Equation 2).

$$L = C_p R_p A + C_a \phi_a V_d A + [K_{ol} (1 - \phi_a) C_a (RT/H) A]$$

Atmospheric Deposition = Wet Deposition + Dry Deposition + Gas Phase Absorption (2)

Volatilization is excluded to represent only gross atmospheric deposition (what is being absorbed into the water bodies), and not the portion that volatilizes (leaves the water's surface). Given the above discussion, it is both scientifically and practically justified to use atmospheric gas phase PCB concentrations as a surrogate for atmospheric PCB loadings for the following reasons: (1) the portion of PCB loadings due to dry deposition as compared to wet deposition is small; (2) the gas phase concentration governs wet deposition; and (3) the gas phase absorption of PCBs in the atmosphere makes up greater than 90 percent of the total atmospheric deposition. Furthermore, even though the above argument was made using IADN data taken from stations around the Great Lakes, it is reasonable to believe that the relationship between atmospheric gas phase PCB concentrations over the state of Michigan (thereby inland lakes, rivers, and streams) and atmospheric PCB deposition would be the same as it is over the Great Lakes. Thus, it is appropriate to assume that a given percent reduction in atmospheric gas phase PCB concentration will produce an equivalent percent reduction in atmospheric PCB loading to surface waters in the state of Michigan.

4.2 RELATING ATMOSPHERIC LOADING TO FISH TISSUE CONCENTRATION (PRINCIPLE OF PROPORTIONALITY)

The approach for linking atmospheric pollutant loads to fish tissue concentrations for this TMDL is patterned after the statewide mercury TMDL developed by the Minnesota Pollution Control Agency (2007), which drew from the work of Jackson et al. (2000), and a regional mercury TMDL for the Northeast United States (New England Interstate Water Pollution Control Commission, 2007). The approach for this TMDL assumes that the steady-state pollutant concentration in a water body (and fish) is linearly proportional to the atmospheric load.

It is important to note that essentially all PCB modeling approaches (including all of the modeling approaches described in the USEPA TMDL guidance) are based upon the assumption of a linear relationship between PCB load and resulting environmental concentration. A PCB TMDL developed for an impaired reach of the Kawkawlin River⁷ in Bay County, Michigan, similarly assumes a one-to-one relationship between PCB loadings and fish tissue (MDEQ, 2002). This approach is referred to in the USEPA (2011) guidance as a "Level 1" approach and is one of the recommended methods for developing PCB TMDLs.

The selection of a steady-state approach for this TMDL means that time variability is not considered. The ability to consider time variability can be useful in estimating system response time to reductions in load, but is not an essential requirement for TMDL development. In fact, models with the capability of simulating time variable conditions are often applied to represent

⁷ This statewide TMDL will not supercede the existing PCB TMDLs for the Kawkawlin (2002) and Pere Marquette Rivers (2008).

steady-state conditions for purposes of TMDL application, and therefore provide results consistent with the Level 1 approach being used here.

The proportionality model used for this TMDL can be described mathematically in Equation 3 as:

$$\text{Pollutant concentration in water (or fish)} = a \times \text{Pollutant loading} \quad (3)$$

where:

a = Proportionality constant relating pollutant load to environmental (i.e., water or fish) concentration

The proportionality constant, a , is calculated from observed edible fish tissue data and estimated atmospheric PCB loading by rearranging Equation 3 as follows:

$$a = \text{Fish tissue concentration} / \text{Pollutant loading} \quad (4)$$

where:

a = Proportionality constant relating pollutant load to fish tissue concentration

Note that when site-specific characteristics (e.g., flushing rate, solids settling velocity, organic carbon content, bioaccumulation in fish) are available for a given water body, complex mechanistic water quality models can be used to calculate the proportionality constant between load and response for each water body under consideration. However, given the large number of water bodies that are being considered under this statewide TMDL, and the limited amount of data available across the state, it is not feasible to estimate unique proportionality constants for each water body requiring a TMDL.

Equation 4 was used to estimate proportionality constants for all of the water bodies where relevant fish tissue data exist. The variability of observed proportionality constants across the state for lake trout, a top predator fish species known to have high bioaccumulation potential, was evaluated to define an upper bound or threshold proportionality constant (i.e., one that represents a specified upper bound percentile of the observed distribution of proportionality constants for some target fish species). This proportionality constant was used to define the required level of load reduction necessary to achieve the TMDL targets for all impaired waters, as described below. The rationale for basing the TMDL on a threshold proportionality constant is that, by protecting waters where lake trout tissue PCB concentrations are high, the large majority of other waters in the state with fish containing lower levels of PCBs, will also be protected. An explanation of the calculation of the threshold proportionality constant can be found in Section 4.5.

4.2.1 Approach for Calculating Maximum Allowable Load

After a threshold proportionality constant has been defined, Equation 3 can be algebraically rearranged to define the maximum allowable pollutant loading rate that will achieve attainment of the desired water quality target in a given percentage of water bodies, i.e.:

$$\text{Pollutant loading}_{\max} = \text{Pollutant concentration}_{\text{target}} / a_{\text{thresh}} \quad (5)$$

where:

$\text{Pollutant loading}_{\max}$ = Maximum allowable pollutant loading that will attain the fish tissue target

$\text{Pollutant concentration}_{\text{target}}$ = Fish tissue target PCB concentration

a_{thresh} = Threshold proportionality constant, defining an upper bound of observed ratios of fish tissue concentration to pollutant load

4.3 ATMOSPHERIC PCB CONCENTRATIONS

Atmospheric PCB concentrations across Michigan were estimated based on the work described in Venier and Hites (2010b), who analyzed data for numerous persistent organic pollutants from the IADN. Samples were analyzed for the following locations (Figure 7) and time periods:

- Brule River, Wisconsin (1996-2002)
- Eagle Harbor, Michigan (1990-2007)
- Sleeping Bear Dunes, Michigan (1992-2007)
- Chicago, Illinois (1996-2007)
- Cleveland, Ohio (2003-2007)
- Sturgeon Point, New York (1992-2007)

Venier and Hites (2010b) converted observed gas-phase PCB concentrations to partial pressures using the Ideal Gas Law and the average atmospheric temperatures during the 24-hour sampling period measured at each site. They used the software package Minitab 15 to fit a linear regression to the logarithms of the atmospheric PCB partial pressures, resulting in the following equation (Equation 6):

$$\ln P = -14.1 - 1.5 \times 10^{-4} t - 5.31 \cdot (1000/T) + 0.0744 \cdot \log^2(\text{pop}) - 0.0744 \cdot \text{WS} - 0.0671 \cdot \cos(\text{WD}) \quad (6)$$

where:

- P = Atmospheric (atm) PCB
- t = time (Julian date after January 1, 1990)
- T = air temperature (°K)
- pop = population within 25 kilometer (km) radius
- WS = wind speed (mph)
- WD = wind direction (radians)

Analysis of Equation 6 showed that time, air temperature, and population density were the primary factors controlling atmospheric PCB concentration, so the equation was truncated as follows (Equation 7) for purposes of the PCB TMDL:

$$\ln P = -14.1 - 1.5 \times 10^{-4} t - 5.31 \cdot (1000/T) + 0.0744 \cdot \log^2(\text{pop}) \quad (7)$$

Equation 7 is designed for application at a specific location, while the TMDL is required to consider the entire state either as a whole or divided into regions.

To evaluate the spatial differences in atmospheric PCB concentrations across the state, Ecological Drainage Units (EDUs; Higgins et al., 2005) were used to aggregate areas of the state containing similar atmospheric concentrations of PCBs. EDUs are a method of spatially organizing the state based on areas of similar biotic and abiotic characteristics such as freshwater fish and invertebrate species composition and distribution, climate, and physiography. They generally range in size from 1,000 to 10,000 km². Although the EDU boundaries align with watershed boundaries, such that no impaired stream segments will span multiple regions, they are not necessarily true watershed boundaries (Higgins et al., 2005). The EDUs in Michigan are shown in Figure 8.

Equation 7 was used to estimate average atmospheric PCB concentration for each EDU as follows:

The annual average air temperature for each EDU was calculated from spatial data obtained from the National Oceanic and Atmospheric Administration (NOAA) National Climatic Data Center⁸. The average population density (individuals per 25 km radius) was calculated for each EDU using 2010 census data from the Michigan Department of Technology, Management and Budget Center for Shared Solutions and Technology Partnerships⁹. Atmospheric gas phase PCB concentrations for 2010 were calculated as partial pressures (in units of atmospheres) for each EDU, based on population density and average temperature, using Equation 7. Atmospheric PCB partial pressures for each EDU were converted to concentration units (nanograms per cubic meter [ng/m³]) based on the average air temperature determined in Step 1 using the following equation based on the Ideal Gas Law as follows:

$$\text{Mass Concentration, ng/m}^3 = (\text{Partial Pressure, atm}) * (\text{average molecular weight}) * (10^{12} \text{ ng/kg}) * (1 \text{ (kg/m}^3\text{)/(g/L)}) / (\text{Henry's Law Constant } 0.08205746 \text{ L atm K}^{-1} \text{ mol}^{-1}) / (\text{Temperature } ^\circ\text{K}).$$

An average molecular weight of 288 g/mol was based on an assumed mixture of 65 percent Aroclor 1242 at 266.5 and 35 percent Aroclor 1254 at 328, from the reported measurements for the city of Chicago by Hu et al. (2010). The temperature in °K was obtained as T + 273.15, where T is the temperature in °C associated with the partial pressure being converted.

⁸ See http://hurricane.ncdc.noaa.gov/cgi-bin/climaps/climaps.pl?directive=order_details&subnum=®ion=Lower%2048%20States&filename=te mp0313

⁹ See <http://www.michigan.gov/cgi/0,4548,7-158-54534---,00.html>

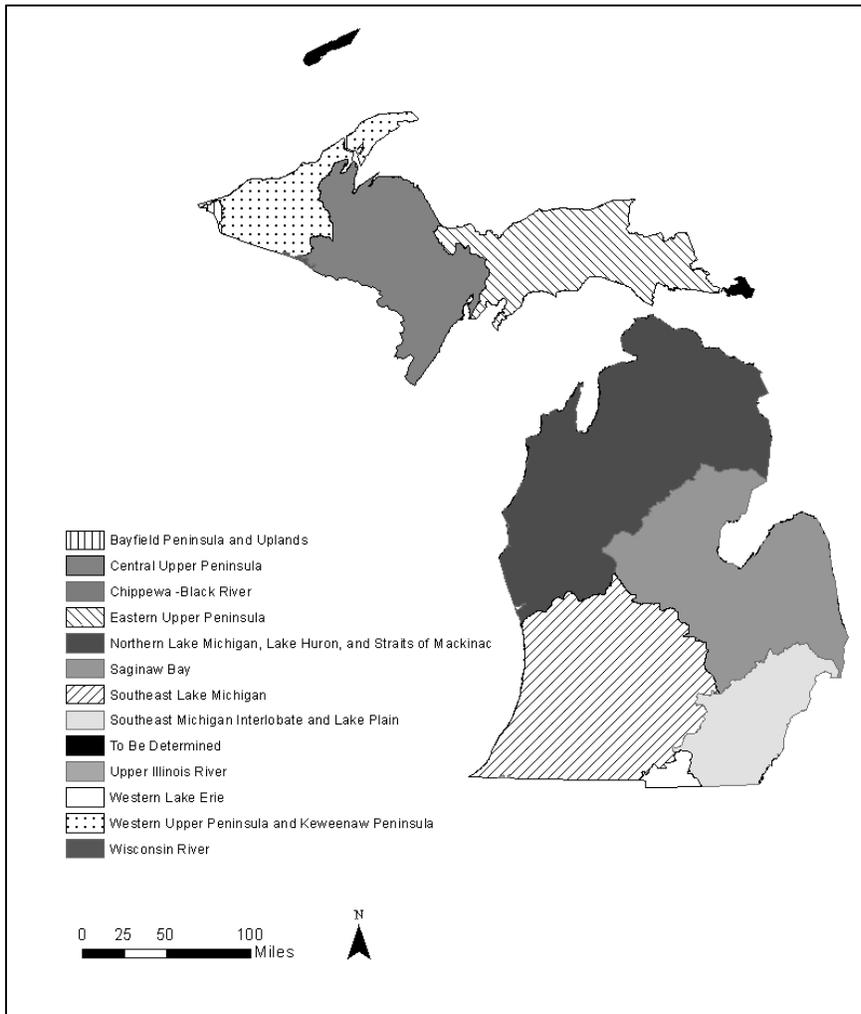


Figure 7. Ecological Drainage Units in Michigan.
 (Data source: Higgins et al, 2005)

Table 4 summarizes the resulting atmospheric PCB concentration averaged across each EDU in the state. These concentrations are mapped by EDU in Figure 9.

Table 4. Estimated 2010 Annual Atmospheric PCB Concentration (ng/m³) Averaged by EDU.

Ecological Drainage Unit (EDU)	Average Population Density (individuals per 25 km radius)	Average Total Gas Phase PCB Conc. (ng/m³)	Daily Maximum Total Gas Phase PCB Conc. (ng/m³)	Area of EDU (miles²)
Bayfield Peninsula and Uplands	<1,000	0.017	0.259	91.72
Chippewa-Black River	<1,000	0.017	0.230	0.45
Upper Illinois River	<1,000	0.017	0.279	7.49
Wisconsin River	<1,000	0.017	0.230	41.70
To Be Determined (includes Isle Royale and Drummond Island)	6,213	0.050	0.246	349.58
Western Upper Peninsula and Keweenaw Peninsula	11,199	0.052	0.315	3,295.46
Eastern Upper Peninsula	10,640	0.057	0.284	5,875.56
Central Upper Peninsula	19,117	0.062	0.363	6,707.16
Northern Lake Michigan, Lake Huron, and Straits of Mackinac	41,265	0.087	0.453	14,723.62
Western Lake Erie	43,243	0.102	0.482	457.01
Saginaw Bay	114,819	0.133	0.636	10,295.58
Southeast Lake Michigan	176,980	0.159	0.739	11,318.04
Southeast Michigan Interlobate and Lake Plain	830,371	0.278	1.372	4,121.54

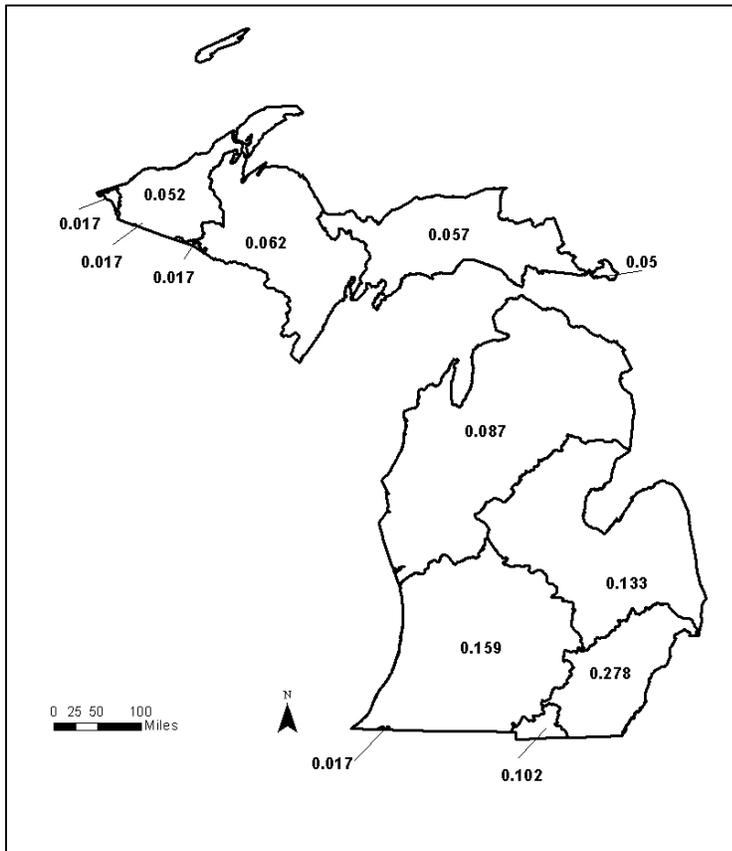


Figure 8. Annual Average Atmospheric Gas Phase PCB Concentration (ng/m³) by EDU.

4.4 REGIONALIZATION

Statewide TMDLs can be structured to produce a single statewide average loading reduction; conversely, they can be structured by dividing the state into geographic regions and produce a loading reduction unique to each region. Although detailed investigations were made into a variety of potential regionalization schemes, a policy decision was made by the MDEQ and USEPA to calculate a single, statewide average required reduction percentage for PCBs. The primary basis for this decision is that a consistent pattern between fish tissue and air concentration of PCBs was lacking throughout the state. There was no discernible regional pattern to justify breaking up the state into different regions based on PCB concentrations. The concern that this approach may be under-protective in some regions of the state (i.e., those requiring greater than average percent reductions) will be addressed in Section 7 through the use of post-TMDL monitoring to identify specific waters across the state that still do not meet WQS as a result of this TMDL. These waters may have site-specific TMDLs developed in the future if necessary. Lastly, as discussed in Section 2.1.2, both fish and atmospheric concentrations of PCBs have been declining since 2000, and continued declines will enable all parts of the state to meet reduction targets.

4.5 THRESHOLD PROPORTIONALITY CONSTANT

Fish tissue PCB concentrations are related to atmospheric PCB loadings by a proportionality constant. In this TMDL, gas phase atmospheric PCB concentrations are used as a surrogate for atmospheric PCB loadings. Therefore, in theory, a proportionality constant could be calculated for each water body where relevant fish tissue data are available. However, relevant fish tissue data were not available for every water body impaired by PCBs on the Section 303(d) impaired waters list to derive a site-specific proportionality constant. For water bodies lacking fish tissue data, it was necessary to develop an approach for estimating a proportionality constant. The approach uses the observed variability in calculated proportionality constants for waters where fish tissue data exist for lake trout to represent the variability of proportionality constants for all water bodies across the state. Statistical methods are then used to calculate a statewide threshold proportionality constant.

4.5.1 Selection of an Appropriate Upper Bound

The threshold proportionality constant is defined as one that represents a specified upper bound percentile of the observed distribution of proportionality constants for a target fish species, in this case lake trout. The selection of a 90th percentile value to represent the threshold upper bound results in a large majority (i.e., 90 percent) of the waters in the state having a lower proportionality constant than the threshold proportionality constant calculated as a statewide value. Use of this 90th percentile threshold proportionality constant in Equation 5 to develop the TMDL would therefore result in 90 percent of the waters in the state containing a top predator species with high bioaccumulation potential being expected to attain the target goal of the TMDL (i.e., 0.023 mg/kg) after the required reductions are made.

The choice of a specific percentile PCB to represent the upper bound of a threshold proportionality constant is a state policy decision. Both the Minnesota and the Northeast United States mercury TMDLs used the 90th percentile as the basis of protection in these TMDLs. The justification given for selecting the 90th percentile included:

- The 90th percentile of samples from a given water body has been used as assessment guidance by the USEPA (i.e., no more than 10 percent of the samples can exceed the standard) (Minnesota Pollution Control Agency, 2007).
- Targets were based on PCB tissue concentrations for a fish species having one of the highest levels of contamination. Achieving the target level for the 90th percentile of a top predator species with observed high levels of contamination ensures that the overwhelming majority of species in lower trophic levels will meet the target level.
- As fish tissue levels are reduced and the 90th percentile approaches the target value, the concentration difference between the 90th and higher percentiles is likely to be very small.
- Use of the 90th percentile allows for outlier water bodies that may have unique circumstances. The outliers can be addressed individually as part of the adaptive watershed management approach to TMDL implementation through implementing as many elements of multi-media programs as possible to reduce PCB loadings (USEPA, 2011).

There are tradeoffs that need to be considered in selecting the percentile to be used. Use of the 90th percentile may result in the need to develop additional TMDLs for those water bodies with proportionality constants higher than the 90th percentile value. Conversely, selection of a higher

percentile would result in required load reductions that would be larger than necessary to attain WQS for the large majority of water bodies.

4.5.2 Selection of a Target Fish Species

Michigan's FCMP database (including PCB data in fish tissue collected from 1980 to 2009) was used to identify the fish species to serve as the basis for required TMDL loading reductions. Only data from the edible portion monitoring program were considered since these are the data that support the fish consumption designated use. Fish tissue PCB concentrations have been sampled in a wide range of species across Michigan, and show varying degrees of bioaccumulation. Furthermore, multiple different species serve as the basis for fish consumption advisories across the state. For development of the statewide TMDL, lake trout was chosen as the target fish species and was used to determine from what levels PCBs in fish tissue would need to be reduced in order to meet the TMDL target.

Available fish tissue PCB concentration data for all species sampled across the state were evaluated to exclude sites with legacy PCB sources and/or Great Lakes influence. Based on this evaluation, it was determined that lake trout would be the species on which to base atmospheric load reductions to meet the fish tissue concentration target of 0.023 mg/kg for the TMDL.

PCB tissue levels in lake trout are among the highest observed for all species of fish throughout the state because of their location towards the top of the food chain, their high lipid content, and their relatively long life, and thus their potential for high bioaccumulation of toxic contaminants like PCBs. Load reductions based on using the 90th percentile of lake trout PCB tissue levels will be generally protective of tissue levels for other species of fish since lake trout tissue levels tend to be some of the highest. Furthermore, lake trout are a top predator, consistent with the trophic level of fish used to derive the HCV water quality criterion.

4.5.3 Calculation of Threshold Proportionality Constant

Lake trout PCB tissue concentration data from Michigan were compiled and analyzed to calculate a statewide threshold proportionality constant for use in developing required PCB load reductions. The analysis consisted of:

- **Removing data collected prior to the year 2000:** Data collected prior to 2000 were judged to be non-representative of current conditions for two reasons. First, PCB concentrations in fish were much higher prior to 2000, and have since declined at a slower rate than pre-2000 (Table 1). Second, the analysis methodology for PCBs in fish changed in 2000 from reporting Total Aroclors (industrial mixtures) to Total Congeners. Data post-2000 for edible portions of fish tissue were available for seven water bodies (Table 5).
- **Calculating the mean PCB tissue concentration in lake trout for each water body:** Lake trout tissue PCB concentrations in an individual sample can depend upon the size of the fish. Potential length-related biases in the calculation of mean tissue PCB concentrations were removed by calculating the expected PCB concentration in a "standard length" fish in each water body. Statistical regressions between fish length and observed tissue concentrations were conducted for each water body. For those water bodies showing a statistically significant ($\alpha = 0.01$) regression between tissue concentration and length, the mean PCB concentration was calculated using the

site-specific regression and a fish length of 24 inches. This length was selected as the standard length because it was the average length of all lake trout that were analyzed. For those water bodies not showing a statistically significant regression between tissue concentration and length, the mean concentration in a standard length fish was calculated as the average of all observed tissue concentration data for that water body. Resulting PCB concentrations in fish tissue for each water body are shown in Table 5.

- **Calculating the proportionality constant associated with each water body:** Calculation of a proportionality constant requires an estimate of atmospheric load and observed fish tissue concentration data. Atmospheric gas phase PCB concentrations are being used as a surrogate for atmospheric load in this TMDL, as discussed previously in Section 4.1. The regression of Venier and Hites (2010b) as shown in Equation 6 was applied to calculate an atmospheric PCB concentration corresponding to each lake trout sampling location specific to the year the lake trout were collected. A proportionality constant for each water body was generated by calculating the ratio of mean lake trout tissue PCB concentration to atmospheric gas phase PCB concentrations (Table 5).
- **Calculating the statewide threshold proportionality constant:** The observed proportionality constants shown in Table 5 were assessed using Minitab statistical software. Maximum likelihood estimation, as implemented in the Minitab program and based on an assumption of a log-normal distribution, was used to calculate a 90th percentile value for the threshold proportionality constant. The 90th percentile threshold proportionality constant determined to represent a statewide value was calculated to be 3.293 (mg/kg)/(ng/m³).

Table 5. Lake Trout Data Used to Calculate a Threshold Proportionality Constant.

Water Body Name	Location	Collection Date	# Fish	Mean Tissue PCB (mg/kg)	Proportionality Constant (mg/kg)/(ng/m ³)	Average Atmospheric PCB at Time of Fish Sample Collection (ng/m ³)
Crystal Lake	Benzie County	9/6/2000	15	0.17	1.75	0.096
Elk Lake	Grand Traverse/ Antrim County	4/11/2006	9	0.12	1.24	0.095
Glen Lake	Leelanau County	6/1/2009	9	0.14	1.55	0.088
Green Lake	Grand Traverse County	6/4/2003	10	0.12	1.25	0.098
North Lake Leelanau	Leelanau County	10/21/2003	12	0.27	2.78	0.098
Siskiwit Lake	Isle Royale	6/29/2002	10	0.04	0.64	0.060
Torch Lake	Antrim County	3/15/2009	11	0.36	4.02	0.089
90th percentile value					3.293	

4.6 REQUIRED REDUCTION PERCENTAGE

The overall reduction percentage required to meet TMDL targets were determined through the following steps:

1. Calculating the average atmospheric PCB concentration in the state.
2. Combining the atmospheric PCB concentration with the threshold proportionality constant to calculate expected fish tissue concentrations for existing conditions.
3. Determining the percentage by which existing tissue concentration would need to be reduced to attain the 0.023 mg/kg fish tissue target statewide.

A single area-weighted average atmospheric gas phase PCB concentration was calculated to be 0.115 ng/m³ for the entire state. This value was multiplied by the area-weighted threshold proportionality constant of 3.293 (mg/kg)/(ng/m³) based on the 90th percentile values to produce an estimated fish tissue PCB concentration of 0.378 mg/kg. This concentration represents the existing PCB concentration in fish. Based on this analysis, a 94 percent reduction in year 2010 atmospheric gas phase PCB concentrations would be required to meet the fish tissue target of 0.023 mg/kg, since a one-to-one ratio reduction in atmospheric gas phase PCB concentrations will result in a one-to-one reduction of fish tissue PCB concentrations.

5.0 SOURCE ASSESSMENT

5.1 SOURCES OF PCBs

Because PCBs are a synthetic, man-made compound, they have no natural sources. Before the USEPA's ban of PCB production in 1979, sources of PCBs were a wide variety of electrical equipment including fluorescent light ballasts and industrial oils, lubricants, and other fluids. Release into the environment occurred through sewers, smokestacks, stormwater runoff, and direct application. Most PCBs that still remain in the environment are stored in sediment or tissue from legacy use (as opposed to new production) and are introduced to water bodies through outdated or illegal landfills and scrap yards and leaks or explosions of electrical equipment and other equipment that still contain PCBs (Agency for Toxic Substances and Disease Registry, 2001). PCBs can also be reintroduced to water bodies through the movement of contaminated sediments, volatilization from water or soil, wet and dry atmospheric deposition and revolatilization (Hazardous Substances Data Bank, 2003). There are several facilities with permits that are authorized to release PCBs into the air in Michigan (Table 6). The total loadings of PCBs to the atmosphere from these facilities were estimated to be about 1.06 lbs/year.

Table 6. Permitted Air Releases of PCBs, 2008.
(Source: Michigan Air Emission Reporting System [MAERS])

Facility Name	Location	Release of PCBs to Air (lbs)
Decorative Panels International, Inc.	Alpena, MI	0.012907
Flint Water Pollution Control Facility	Flint, MI	0.203654
Warren Wastewater Treatment Plant	Warren, MI	0.343097
Empire Iron Mining Partnership	Palmer, MI	0.003503
Pontiac Wastewater Treatment Plant	Pontiac, MI	0.390172
City of Battle Creek Wastewater Treatment Plant	Battle Creek, MI	0.104457
Sekisul Voltek LLC.	Coldwater, MI	0.000003
Total*		1.057792

*Numbers do not sum exactly due to rounding.

5.1.1 Compilation of Source Data

To identify the current sources of PCBs to Michigan's inland water bodies, all readily available information describing point sources (e.g., Superfund and other contaminated sites, National Pollutant Discharge Elimination System (NPDES) permitted stormwater dischargers), and nonpoint sources (e.g., atmospheric deposition) was compiled. PCB data spanned the period 1980 to 2011, with coverage varying spatially and by media. Fish data were obtained for the period 1980 to 2009, water data were obtained for the period 1998 to 2003, air data were obtained for the period 1990 to 2007, and sediment data were available for the period 2000 to 2002. In addition to environmental data, geographic datasets were also obtained to understand the spatial variation in PCB impairment, and other relevant contributing factors such as land cover (Table 7). These data were used to identify a range of point and nonpoint source loadings of PCBs.

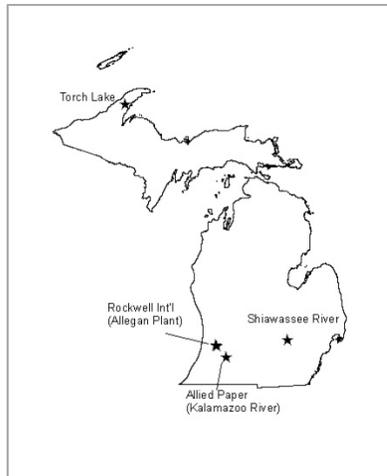
Table 7. Geographic Datasets Obtained.

Description of Data	Type of Dataset	Source
Streams and Rivers (lines) from version 10a of the Michigan Geographic Framework dataset.	Hydrography	Michigan Center for Geographic Information (MCGI)
Lakes and Rivers (polygons) from version 10a of the Michigan Geographic Framework dataset.	Hydrography	MCGI
Lake polygons for the State of Michigan.	Hydrography	MCGI
Lake contour data for lakes managed for recreational boating access	Hydrography	MCGI
Polygons representing the boundaries of cities in Michigan.	Political	MCGI
Polygons representing the boundaries of counties in Michigan.	Political	MCGI
Polygons representing Michigan village boundaries.	Political	MCGI
2006 National Land Cover data for the entire State of Michigan.		Multi-Resolution Land Characteristic Consortium (MRLC)
High resolution NHD data for the State of Michigan.	Hydrography	United States Geological Survey (USGS)
High resolution NHD data for the State of Michigan: HUC boundaries.	Watershed Boundaries	USGS
Assessment Unit IDs	Hydrography	MCGI
Impaired water body segments	Hydrography	MDEQ
Ecological drainage units	Ecoregion Boundaries	Kendra Cheruvellil (Michigan State University)

5.2 DATA GAP ANALYSIS

After compiling the appropriate databases, two major data gaps were identified: statewide atmospheric deposition of PCBs in populated regions of Michigan and specific load or concentration data from legacy point sources. The following steps were used to fill data gaps. The regression equation developed by Venier and Hites (2010b) was used to estimate atmospheric PCB concentrations as described previously in Section 4.

A subset of the impaired water bodies considered under this TMDL are impaired by legacy contaminated sources (e.g., Areas of Concern [AOCs], Superfund sites) (Figure 10). Those which have cleanup plans in place are expected to meet the TMDL target once the cleanup plan is complete and the reductions listed in this TMDL are met. These water bodies will be placed under the 4b category in Michigan's Integrated Report until monitoring reflects the waters are in compliance with the WQS. Category 4b is intended for water bodies with a pollution control program in place that is expected to solve the pollution problems, such as Superfund and AOC cleanup plans.



a) Superfund Sites with PCBs as a primary contaminant of concern.



b) AOCs in Michigan¹⁰.

Figure 9. Location of Legacy Polluted Sites in Michigan. Note that the Deer Lake and Torch Lake AOCs are not impacted by PCBs.

5.2.1 Baseline Year Selection

Based on the available data, 2010 was chosen as the baseline year for PCBs. This was primarily based on the availability of population data from the 2010 census, which was required to estimate atmospheric deposition using the Venier and Hites (2010b) regression.

5.2.2 Nonpoint Source PCB Loads

Diffuse, or nonpoint sources of PCBs consist primarily of atmospheric deposition and stormwater runoff from the landscape. The original sources of PCBs are landfills, scrap yards, capacitors, transformers, and other electrical equipment, and PCBs from these sources are delivered to Michigan's water bodies through atmospheric deposition. As described in Section 4, PCBs from the atmosphere are deposited onto water bodies in three ways: wet deposition, dry deposition, and net gas exchange.

Since the gas phase of PCBs in the atmosphere makes up ≥ 90 percent of total PCB concentration, gas phase PCB concentration is used as a surrogate of total PCB atmospheric deposition. Atmospheric PCB loading to water bodies was estimated using the truncated Venier and Hites equation (Equation 7). Table 4 summarizes average regional atmospheric PCB concentrations for each EDU in the state for 2010.

5.2.3 Point Sources to Water

Point sources of PCBs under TMDL regulation consist of NPDES-permitted dischargers such as wastewater treatment plants and municipal stormwater discharges. Permitted air emissions (which are called point sources in air quality programs) are considered a nonpoint source PCB load and will be addressed under the Load Allocation (LA) portion of the TMDL. Similar to

¹⁰ Source: Strategy for Delisting Michigan's Great Lakes AOCs.
http://www.michigan.gov/documents/deq/wb-AOC-delisting-strategy_306163_7.pdf

nonpoint stormwater runoff, PCBs in municipal stormwater areas are primarily from atmospheric deposition (LimnoTech, 2011). NPDES dischargers that have water quality-based effluent limits (WQBELs) for PCBs, and which discharge to inland waters were identified by the MDEQ and are presented in Table 10. Even though stormwater regulated under the NPDES stormwater program (i.e., Phase I and Phase II) is traditionally considered to be a point source, available data from NPDES regulated stormwater discharges are not detailed enough to estimate PCB loadings for specific outfalls. In addition, since PCBs in municipal stormwater areas are primarily from atmospheric deposition, reductions to this loading source will be addressed under the LA portion of the TMDL.

6.0 TMDL DEVELOPMENT

A TMDL is defined by the equation:

$$\text{TMDL (LC)} = \text{LA} + \text{WLA} + \text{MOS} \text{ (8)}$$

Where

TMDL = Total Maximum Daily Load (i.e., the Loading Capacity (LC) of the receiving water)

LA = sum of all Load Allocation for nonpoint sources

WLA = sum of all Waste Load Allocations for point sources

MOS = Margin of Safety

Development of TMDLs typically consists of two steps:

1. Determine the LC of the receiving water(s) (i.e., the maximum pollutant load that the water body can assimilate and attain WQS).
2. Allocate this LC among the three categories shown in Equation 8.

This statewide PCB TMDL is unique because it focuses on waters primarily impaired by atmospheric sources. As discussed in Section 4, atmospheric deposition of PCBs is not easily calculated, but can be suitably represented by the surrogate parameter of gas phase atmospheric PCB concentration. For this reason, the LA of the TMDL is specified in units of atmospheric PCB concentration instead of a load. In addition, those point sources suspected of containing significant levels of PCBs have been given WLAs at concentrations equal to the WQS, meaning that they will not be causing impairment.

The combination of the above factors, along with the use of an implicit MOS, means that the PCB reduction required to achieve the TMDL target is based entirely on the LA. This section presents the calculation of the TMDL, and is divided into the following sections:

- Load Allocation
- Waste Load Allocation
- Margin of Safety
- Critical Conditions/Seasonal Variation

A summary of Michigan's statewide PCB TMDL is provided in Table 8.

Table 8. Summary of Michigan's Statewide PCB TMDL.

TMDL Components	Units	Statewide
Target Level and Reduction Factor		
Target Fish PCB Concentration (Fish Tissue Residue Value)	mg/kg	0.023
PCB Concentration for Standard Length Lake Trout	mg/kg	0.378
Reduction Factor		94%
PCB Load for Baseline Year 2010		
Point Source Load	lbs/day	1.57E-06
Maximum Daily Nonpoint Source Concentration	ng/m ³	0.571
Final TMDL		
Margin of Safety (MOS)		Implicit
Waste Load Allocation (WLA)	lbs/day	1.57E-06
Load Allocation (LA) (Maximum Daily Concentration Used as a Surrogate)	ng/m ³	0.034
PCB LA for In-State and Out-of-State Deposition Sources		
In-State Contribution to LA		45%
Out-of-State Contribution to LA		55%
Necessary Reduction from Anthropogenic Emission Sources for both In-State and Out-of-State Contribution		94%

6.1 LOAD ALLOCATION

The calculations in Section 4 demonstrated that a 94 percent reduction in statewide atmospheric PCB concentration is necessary to attain PCB levels that are protective of designated uses. Given an existing atmospheric gas phase concentration of 0.115 ng/m³, a 94 percent reduction results in an allowable annual average concentration of 0.007 ng/m³. As discussed further in the Reasonable Assurance Section (Section 7) it will take the state approximately 50 years to reach the TMDL atmospheric deposition PCB goal.

This TMDL only has regulatory authority over PCBs originating from within the state of Michigan. For that reason, it is necessary to divide existing PCB concentrations into separate components corresponding to: (1) out-of-state sources; and (2) within-state sources. The separation of in-state and out-of-state sources was made using Equation 7 (Section 4.3), which bases total atmospheric PCB concentration on local population. The PCB contribution due to out-of-state sources was defined for this TMDL by the PCB concentration predicted by Venier and Hites (2010a) for local populations associated with wilderness levels (12,500 people per 25 km radius based on the definition of population density in wilderness areas worldwide (Mittermeier et al., 2003). It is difficult to predict the origin of atmospheric PCBs from out of the state. Atmospheric mixing processes are very complex and change constantly. Over time, PCBs depositing on Michigan's inland waters from out-of-state sources could come from other Great Lakes states, or as far away as China (University of Minnesota and LimnoTech, 2009; MacLeod et al., 2005). The PCB contribution due to in-state sources was defined as the difference between the total atmospheric PCB concentration and the concentration attributed to out-of-state sources. Results of this analysis are shown by EDU in Table 9. Several of the

EDUs in the state already had a population density <12,500 per 25 km radius, so for those EDUs, all atmospheric PCBs were assumed to be from out-of-state sources. Lastly, an average statewide contribution from in-state versus out-of-state atmospheric PCBs was estimated using a weighted average for each EDU by percentage of land area. **In-state sources make up 45 percent of the state's atmospheric PCB concentration, while out-of-state sources make up the remaining 55 percent.**

Table 9. Estimated Average Anthropogenic PCB Concentrations by EDU.

Ecological Drainage Unit	Average Population Density (individuals per 25 km radius)	Average Total PCB Conc. (ng/m ³)	Average In-State PCB Conc. (ng/m ³)	Average Out of State PCB Conc. (ng/m ³)
Bayfield Peninsula and Uplands	<1,000	0.017	-	0.017
Central Upper Peninsula	19,117	0.062	0.007	0.055
Chippewa-Black River	<1,000	0.017	-	0.017
Eastern Upper Peninsula	10,640	0.057	-	0.057
Northern Lake Michigan, Lake Huron, and Straits of Mackinac	41,265	0.087	0.025	0.062
Saginaw Bay	114,819	0.133	0.064	0.069
Southeast Lake Michigan	176,980	0.159	0.088	0.072
Southeast Michigan Interlobate and Lake Plain	830,371	0.278	0.207	0.072
To Be Determined (includes Isle Royale and Drummond Island)	6,213	0.050	-	0.050
Upper Illinois River	<1,000	0.017	-	0.017
Western Lake Erie	43,243	0.102	0.030	0.072
Western Upper Peninsula and Keweenaw Peninsula	11,199	0.052	-	0.052
Wisconsin River	<1,000	0.017	-	0.017
Area-weighted Statewide Average		0.115	0.051	0.064

If the TMDL was designed solely to reduce in-state sources, the necessary reductions from these sources would be calculated using Equation 9:

$$\% \text{ reduction in in-state deposition} = \text{RF} / (1 - \% \text{ out-of-state contribution}) \quad (9)$$

Where

RF = Required reduction factor in overall concentration

Given a required reduction factor of 94 percent, and an out-of-state contribution of 55 percent, Equation 9 indicates that in-state sources would need to be reduced by 209 percent if no reductions were made to out-of-state sources. In-state reductions in PCB atmospheric deposition will not achieve the TMDL target alone. Therefore, this TMDL assumes that reductions from out-of-state sources will be consistent with those required for in-state sources (i.e., **94 percent reduction will be required for both in-state and out-of-state sources**). While there are currently no other states developing statewide PCB TMDLs, there are several site-specific TMDLs being implemented throughout the Great Lakes region, and a range of

regional and statewide programs that are working on reductions to PCBs in other states (some of these are discussed in Section 7).

The observed and allowable atmospheric PCB concentrations have all been expressed so far in this document on an average annual basis, because annual averages appropriately reflect the long response time between changes in atmospheric concentration and changes in fish tissue concentrations. The USEPA encourages that TMDLs be expressed on a daily basis, so these annual average concentrations will also be expressed as daily maximum values in this TMDL. Atmospheric PCB concentrations are known to vary seasonally due to changes in air temperature, as indicated previously in Equation 7. Equation 7 was originally applied to define annual average atmospheric PCB concentrations across the state by using annual average temperatures for each EDU. It can also be used to define the daily maximum concentration associated with the annual average, by replacing the average temperature with the expected daily maximum temperature for each EDU.

Equation 7 was used to estimate daily maximum atmospheric PCB concentration for each EDU as follows:

1. The mean extreme maximum temperature (annual) for each EDU was calculated from spatial data obtained from the NOAA National Climatic Data Center¹¹.
2. The average population density (individuals per 25 kilometer radius) was calculated for each EDU using 2010 census data from the Michigan Department of Technology, Management and Budget Center for Shared Solutions and Technology Partnerships¹².
3. Atmospheric gas phase PCB concentrations for 2010 were calculated as partial pressures (in units of atmospheres) for each EDU, based on population density and average temperature, using Equation 7. Atmospheric PCBs partial pressures for each EDU were converted to concentration units (ng/m³) based on the maximum air temperature determined in Step 1 using the following equation based on the Ideal Gas Law:

$$\text{Mass Concentration, ng/m}^3 = (\text{Partial Pressure, atm}) * (\text{average molecular weight}) * (10^{12} \text{ ng/kg}) * (1 \text{ [kg/m}^3\text{]}/[\text{g/L}]) / (\text{Henry's Law Constant } 0.08205746 \text{ L atm K}^{-1} \text{ mol}^{-1}) / (\text{Temperature } ^\circ\text{K}).$$

An average molecular weight of 288 g/mol was based on an assumed mixture of 65 percent Aroclor 1242 at 266.5 g/mol and 35 percent Aroclor 1254 at 328 g/mol, from the reported measurements for the city of Chicago by Hu et al. (2010). The temperature in °K was obtained as T + 273.15, where T is the temperature in °C associated with the partial pressure being converted.

Table 4 summarizes the resulting daily maximum atmospheric PCB concentration for each EDU. A single area-weighted daily maximum atmospheric PCB concentration was calculated for the entire state by weighting the EDU-average PCB concentration by the area of each EDU; this resulted in a concentration of 0.571 ng/m³. It is noted that this value is the daily maximum

¹¹ http://hurricane.ncdc.noaa.gov/cgi-bin/climaps/climaps.pl?directive=order_details&subnrn=®ion=Lower%2048%20States&filename=tmp13a13

¹² <http://www.michigan.gov/cgi/0,4548,7-158-54534---,00.html>

atmospheric PCB concentration that exactly corresponds with the annual average PCB concentration used as the basis for determining required load reductions. Specification of daily maximum concentrations in this manner does not change the required load reduction percentage of 94 percent. **When the 94 percent required reduction is applied to meet TMDL targets, the average daily maximum atmospheric PCB concentration is 0.034 ng/m³.**

6.2 WASTE LOAD ALLOCATION

The WLA is defined as the portion of the LC attributed to existing and future permitted point sources. As discussed in Section 5 (Source Assessment), PCB loads for point sources consist of regulated wastewater (i.e., industrial, landfills, and Superfund sites), air, and stormwater discharges. Stormwater regulated under the NPDES Municipal Separate Storm Sewer System (MS4) program (i.e., Phase I and Phase II communities) is considered to be a point source under TMDL regulation. However, available data from NPDES regulated stormwater discharges are not detailed enough to estimate PCB loadings for specific outfalls. In addition, since PCBs in municipal stormwater areas are primarily from atmospheric deposition, this loading source will be considered under the LA portion of the TMDL, and will be addressed with controls to atmospheric loading necessary to meet the LA. Michigan has a well-developed program to address and control stormwater pollution through the implementation of Best Management Practices as required by the Clean Water Act. Any PCBs in stormwater that are not addressed by reductions in atmospheric sources will be addressed by state municipal and industrial NPDES stormwater permit regulations.

WLAs were calculated for the 11 facilities that have PCB WQBELs in their NPDES permits or substantive requirement documents (SRD) and discharge to an inland water body (Table 10). Superfund sites that have current on-site remediation are exempt from obtaining NPDES permits under Section 121(e) of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). However, the CERCLA does mandate attainment of all applicable or relevant and appropriate requirements. Therefore, SRDs are issued by the state of Michigan to provide necessary surface water protection for on-site Superfund site cleanups. The WLA for each facility listed in Table 10 is equal to the permitted PCB effluent concentration, which is the HCV WQS (0.026 ng/L), multiplied by the facility's design flow as authorized by their NPDES permit. This results in a total WLA of 1.57E-06 lbs/day for all permitted facilities.

Table 10. PCB Point Source Loads.

Designated Name	Permit No. or SRD No.	Authorized Flow (MGD)	Load (lbs/day)
G and H LF PRP Group	MIU990012	0.558	1.21E-07
Georgia Pacific-King Hwy SF	MIU990018	0.288	6.24E-08
GM - Pontiac SW Facility	MI0058908	1.44	3.10E-07
GM-Powertrain Flint North	MI0001597	0.022	4.80E-09
Liquid Disposal Inc-SF Site	MIU990003	0.05	1.10E-08
Organic Chemicals-SF Site	MIU990002	0.3	5.00E-08
Rose Twp Settling Defendant-SF	MIU990014	0.65	1.10E-07
Saginaw Twp-Center Rd LF	MI0054739	0.024	5.20E-09
U.S. EPA-Plainwell Dam SF	MIU990028	0.108	2.34E-08
U.S. EPA-Shiawassee River SF	MIU990023	0.013	2.80E-09
Wayne Disposal Inc LF	MI0056413	4	8.70E-07
Total WLA			1.57E-06

6.3 MARGIN OF SAFETY

The MOS is a required part of the TMDL to account for any uncertainty in the relationship between pollutant loading and receiving water quality (40 CFR, Part 130.7(c)(1)). The MOS can be either explicit (e.g., stated as an additional percentage load reduction) or implicit (i.e., conservative assumptions in the TMDL calculations or overall approach) in the calculations of the TMDL, or a combination of the two. For this PCB TMDL, the MOS is implicit because of the following conservative assumptions used to calculate the TMDL:

- The 90th percentile fish tissue concentration of PCBs for lake trout was used as a basis for this TMDL. Lake trout are large piscivorous fish, meaning that they are relatively high in the food web and represent fish that are also relatively high in fish tissue PCB concentrations. Therefore, the 90th percentile PCB concentration for lake trout is a relatively high concentration of PCBs, and most fish in the state will likely have a lower tissue PCB concentration. Calculating the TMDL based on this relatively high PCB tissue concentration incorporates a MOS into determining the percent reduction required of fish tissue to meet the target goal.
- The United States Food and Drug Administration and MDCH fish tissue PCB fish advisory trigger value is 2.0 mg/kg for the general population. This TMDL uses 0.023 mg/kg as the fish tissue target concentration for PCBs (as discussed in Section 3.2). Therefore, the difference between the fish target concentration of 0.023 mg/kg and the higher MDCH advisory trigger level of 0.2 mg/kg for sensitive populations includes a substantial MOS.

6.4 CRITICAL CONDITIONS AND SEASONAL VARIATION

TMDL calculations are required to consider critical environmental conditions such as seasonal variations in stream flow, loadings, and water quality parameters (40 CFR, Part 130.7(c)(1)). PCB concentrations in the atmosphere and water column can fluctuate seasonally; however, fish slowly accumulate PCBs over time. Due to the extremely slow response time of water and fish concentrations to changes in atmospheric loads, essentially no seasonal variation occurs in

fish PCB concentrations due to seasonal variations in atmospheric concentrations. The PCB concentration in the fish represents an integration of all temporal variation up to the time of sample collection. Variability among fish because of differences in size, diet, habitat, and other undefined factors are expected to be greater in sum than seasonal variability. Since organochlorine compounds, such as PCBs, are manifested over long periods of time (rather than seasonally), short-term variations in loading are not likely to result in significant variations in designated use effects (e.g., fish consumption) (USEPA, 2011).

Parameter-specific critical conditions, such as the decrease in low dissolved oxygen just before dawn, are not relevant to PCBs in fish because the fish tissue concentrations reflect integration over time of various factors. However, there are critical conditions in the sense that certain water bodies and fish species are more likely to bioaccumulate PCBs because of their biochemistry. This aspect of critical conditions has been addressed in this TMDL by: 1) using a top predator fish species known to have high bioaccumulation potential; (2) basing the TMDL on a threshold proportionality constant that represents a water body particularly sensitive to atmospheric PCBs; and (3) conducting further study on water bodies from the TMDL where existing fish tissue data indicate that TMDL reductions will not bring that particular water body into attainment of designated uses.

7.0 REASONABLE ASSURANCE AND IMPLEMENTATION

To achieve the PCB LC allocations described in Section 6.0, significant reductions in atmospheric nonpoint source must occur. This TMDL assumes that atmospheric nonpoint source PCB loads to Michigan waters will be reduced in the future and eventually meet the LA under this TMDL. TMDLs that allow for reduction in sources for which an NPDES permit is not required should provide a reasonable assurance that the controls will be implemented and maintained. As discussed below, there are numerous state and federal regulations and other activities that are expected to reduce future PCB concentrations to levels consistent with the TMDL.

This section addresses general implementation measures and reasonable assurances, for making progress towards achieving the water quality target in this TMDL. It is divided into separate discussions of:

- Observed Reductions in Atmospheric PCB Concentrations
- Cleanup of Legacy Sources
- Restriction of Landfill Disposal of PCBs
- Regulations Governing Transport of PCBs
- Federal Toxic Substances Control Act (TSCA)

7.1 OBSERVED REDUCTIONS IN ATMOSPHERIC PCB CONCENTRATIONS

This TMDL is designed to control PCB loads to inland Michigan waters from atmospheric deposition. Monitoring data over the last several decades have shown a steady and steep decline in atmospheric concentration of PCBs in the Great Lakes region (Figure 2).

This decline in atmospheric deposition of PCBs can be attributed to the ban on the manufacture and use of PCBs in the United States in the 1970s. As PCB containing equipment wears out and is replaced with non-PCB containing equipment; PCB containing oils and equipment are properly disposed of; and, processes which resulted in the manufacture of PCBs as a byproduct are identified and modified, PCBs are removed from the environment as evidenced in the downward trend of PCB atmospheric deposition monitoring data.

The regression developed by Venier and Hites (2010a) shows that atmospheric PCBs in the Great Lakes region are decreasing over time, with a half-life of approximately 12.5 years. If atmospheric concentrations maintain this rate of decline, they will achieve the TMDL reduction goal in approximately 50 years. The implementation actions discussed earlier in this section may accelerate this rate of decline, by actively removing historical sources of PCBs that have been previously volatilizing and contributing to elevated atmospheric PCB concentrations.

7.2 CLEANUP OF LEGACY SOURCES

Formal cleanup plans are in place at several sites influenced by legacy sources. The Great Lakes Legacy Act was signed into law in 2002, and authorized by Congress in 2008, to provide funding to clean up contaminated sediment in AOCs in the Great Lakes. While these AOCs focus on Great Lakes waters not considered by the TMDL, many of the cleanup plans extend inland to waters covered by this TMDL.

The CERCLA provides a federal "Superfund" to clean up uncontrolled or abandoned hazardous waste sites. Sites eligible for long-term cleanup action under the Superfund program are included on the National Priorities List, a list of environmentally contaminated sites, published by the USEPA, which pose an immediate or significant public health threat to the local community. Michigan currently has 86 sites on the National Priorities List¹³ many of which include contamination by PCBs. Cleanup plans are in place for all of these sites. The remediation of these legacy sites will provide two mechanisms for helping to achieve the TMDL. First, these cleanups will allow designated uses to be attained at legacy sites after atmospheric PCB concentrations are reduced to levels required by the TMDL. Second, these cleanups will contribute to the necessary reduction of local atmospheric PCB concentrations, as volatilization of PCBs from legacy sites can serve as a source of PCBs to the atmosphere.

Three initiatives seek to support the cleanup of legacy sites and reduce PCB pollution of water in the Great Lakes region. While these efforts are directed towards the Great Lakes, it is likely that any PCB reductions in the region will also result in PCB reductions in inland waters (especially reductions in atmospheric PCB concentrations). The Great Lakes Restoration Initiative (GLRI) is a collaboration of 16 federal agencies. The GLRI Action Plan listed cleanup of legacy sources of toxics as one of the initiative's priorities. A major goal is to delist all the AOCs, including six AOCs in Michigan prioritized to be delisted by 2014 (GLRI, 2010). The Binational Toxics Strategy is a joint effort of the United States and Canada started in 1997 to address the effects of toxic pollutants in the Great Lakes basin through goal-setting and tracking to assess progress on reducing contamination (USEPA and Environment Canada, 2009). In addition, the Great Lakes Water Quality Agreement was updated in September 2012 to address current threats to Great Lakes water quality.

7.3 RESTRICTIONS OF LANDFILL DISPOSAL OF PCBs

Volatilization of PCBs from Michigan landfills is another source of PCBs contributing to high local atmospheric PCB concentrations (Breivik et al., 2002). R 324.11514 of Part 115, Solid Waste Management, of the NREPA, was amended by 2004 PA 34 to prohibit PCBs from being delivered to a landfill for disposal, and also prohibits a landfill owner or operator from permitting the disposal of PCBs in their landfill.¹⁴ However, as mentioned in Section 5.1, there are certain regulated facilities that can still receive PCBs.

7.4 REGULATIONS GOVERNING TRANSPORT OF PCBs

Leakage and/or illegal dumping of PCB-contaminated liquid waste, and subsequent volatilization, are additional sources of PCBs to Michigan's atmosphere (ATSDR, 2001). Michigan regulations now require the use of uniform hazardous waste manifests for all regulated shipments of PCB waste as required in Part 147, PCB Disposal, of the NREPA as per the current Operational Memos 121-4 and 147-1¹⁵.

¹³ See <http://www.epa.gov/region5superfund/npl/michigan/index.html>

¹⁴ See http://www.michigan.gov/documents/deq/DEQ-WHMD-OpMemo_115-27_271593_7.pdf

¹⁵ See http://www.michigan.gov/documents/deq/deq-whm-hwp-uniform-manifest-requirements_213003_7.pdf

7.5 FEDERAL TOXIC SUBSTANCES CONTROL ACT

The TSCA authorizes the USEPA to control any substance determined to cause unreasonable risk to public health or the environment. The TSCA includes, among other things, prohibitions on the manufacture, processing, and distribution in commerce of PCBs. Thus, the TSCA legislated from the manufacture to disposal management of PCBs in the United States. The current PCB regulations were published pursuant to this act and can be found at 40 CFR, Part 761¹⁶.

¹⁶ See <http://www.epa.gov/epawaste/hazard/tsd/pcbs/pubs/laws.htm>

8.0 POST-TMDL MONITORING

Post-TMDL monitoring consists of collecting and analyzing data to evaluate how well a TMDL is working towards attaining WQS. This monitoring can assist in determining whether planned control actions are sufficient to attain WQS, or whether further measures need to be implemented. This section describes monitoring to measure PCB concentrations in fish, water, and air to track trends in water quality and to determine TMDL effectiveness.

8.1 MICHIGAN DEPARTMENT OF ENVIRONMENTAL QUALITY MONITORING

Three of the four monitoring goals described in the MDEQ's Water Quality Monitoring Strategy directly align with post-TMDL monitoring goals. These are as follows: (1) assess the current status and condition of waters of the state and determine whether WQS are being met; (2) measure spatial and temporal water quality trends; and (3) evaluate the effectiveness of water quality prevention and protection programs. These goals are assessed through evaluation of a variety of types of data. For post-TMDL monitoring involving PCBs, it is recommended that fish contaminant data collected by state agencies be assessed for PCBs at a frequency that is consistent with what has historically been done by the state to track trends in water quality. In addition to the programs described below, PCB data collected through the MDEQ's Michigan Inland Sediment Trend Monitoring Program and Michigan Wildlife Contaminant Monitoring Program may also be used to assess trends.

8.1.1 Fish Contaminant Monitoring Program

The FCMP is part of the MDEQ's Water Quality Monitoring Strategy. Edible portion fish contaminant data are used by the MDCH to develop the Michigan Fish Advisory. Whole fish data are used to track contaminant trends and caged fish data are used to identify sources of pollutants and evaluate spatial trends of contaminant concentrations.¹⁷ Both of these organizations will generate data that can be used to evaluate TMDL effectiveness.

8.1.2 Water Chemistry Monitoring Program

Until 2007, the MDEQ's Water Chemistry Monitoring Program included PCB analysis and was comprised of the elements listed below. These are relevant to post-TMDL monitoring if ambient water column PCB analysis is reinstated as they can be used to assess progress:

- Fixed station trend (Saginaw and Grand Traverse Bays, connecting channels, 31 tributaries).
- Watershed surveys (consistent with the 5-year basin cycle).
- Minimally impacted sites.
- Issue sites (TMDLs, nonpoint sources, etc.).

8.1.3 Water Body NPDES Monitoring Program

Effluent PCBs are measured and reported for those NPDES-permitted facilities that have effluent PCB WQBELs. These monitoring data are provided to the MDEQ and can be reviewed to determine whether the facilities are meeting WQBELs. In addition, caged-fish studies used to

¹⁷ See <http://www.deq.state.mi.us/fcmp/>

identify new point sources of PCBs being discharged will be used to justify inclusion of WQBELs for PCBs in future NPDES permits.

8.1.4 Legacy Site Cleanup and Follow-Up Monitoring

A limited amount of water chemistry, sediment, and fish tissue data are collected as part of legacy site cleanup plans (i.e., Superfund sites) that address PCBs. The Allied Paper Inc./Portage Creek/Kalamazoo River Superfund Site, referred to as the Kalamazoo River Superfund Project, has a long-term monitoring plan to document and monitor levels of PCBs in sediment, soil, water, and biota after remediation activities have occurred. This information will be reviewed in the future, and used to evaluate the progress made in reductions of PCBs.

8.2 ATMOSPHERIC PCB MONITORING

The United States and Canada jointly maintain the Great Lakes IADN Program. The IADN has been designed with one Master Station on each of the five Great Lakes, supplemented by a number of Satellite Stations to provide more spatial detail for deposition (Figure 7). The Master Stations offer the complete range of measurements made in the Network, measuring wet and dry deposition of Semivolatile Organic Compounds and trace metals. Satellite Stations may contain only a portion of the measurements made at the Master Stations.

Continued monitoring will occur by reviewing PCB concentrations measured at IADN stations as data become available to assess whether atmospheric PCB concentrations continue to decline as projected by the Venier and Hites (2010b) equation.

8.3 NEW MONITORING AND ASSESSMENT DATA

As part of Michigan's monitoring and assessment programs, new data, including fish tissue data, and some limited water column data, will be collected. New fish tissue data are typically considered and evaluated during the state's two-year integrated reporting cycle pursuant to Sections 305(b) and 303(d) of the Clean Water Act. There are three possible outcomes of the state's assessment of new fish tissue and/or water column data for any lake or river assessment unit:

1. The assessment unit is determined to be addressed by this TMDL if the fish tissue target PCB concentration is less than or equal to the fish tissue target concentration (0.023 mg/kg) or ambient water column PCB concentrations less than or equal to the water column target concentration (0.026 ng/L).
2. The assessment unit is placed in Category 3 of Michigan's Integrated Report due to insufficient data.
3. The assessment unit is placed in Category 5 (i.e., not attaining) of Michigan's Integrated Report if the fish tissue PCB concentration meets the criteria in the future assessment methodology for an impaired water body and is greater than 0.023 mg/kg.

Upon consideration of new fish tissue PCB data and other relevant information, the state may revise this TMDL during future integrated reporting cycles through revisions to Appendix A of this TMDL, provided that the state did not make any revisions to the TMDL targets, reduction factors, LCs, LAs, reduction goals, or any other element established in this TMDL.

The state will not revise any other portion of the original TMDL, other than Appendix A (the list of lake and river assessment units addressed by the TMDL). All other elements of the original TMDL along with its supporting documentation remain unchanged.

9.0 REFERENCES

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**APPENDIX A.
LIST OF PCB-IMPAIRED INLAND WATER BODIES SUBMITTED
FOR APPROVAL UNDER THIS TMDL**

AUID	Water Body Name	Basis of PCB Impairment
040301080408-01	Includes: Black Creek and Sturgeon River	Fish and Water
040301080708-01	Includes: Bird Creek, Blom Creek, DeHaas Creek, Hammond Brook and Pemene Creek	Fish and Water
040301080805-01	Includes: Hugos Brook, Little Cedar River and Little Kelley Creek	Fish and Water
040500010101-01	Includes: Unnamed Tributaries to Allen Lake, Berry Lake, Carpenter Lake, Hemlock Lake, Lime Lake, Long Lake, Look Lake, Paw Paw Lake, Round Lake, and Suckey Lake	Fish and Water
040500010102-01	Includes: Little Hog Creek and South Branch Hog Creek	Fish and Water
040500010103-01	Includes: Tallahassee Creek	Fish and Water
040500010104-01	Includes: Unnamed Tributaries to Coldwater Lake, East Long Lake, Little Coldwater Lake, and Wright Lake	Fish and Water
040500010105-01	Includes: Unnamed Tributaries to Archer Lake, Bartholemew Lake, Marble Lake, Middle Lake, and Wright Lake	Fish and Water
040500010105-04	Includes: Fisher Creek	Fish and Water
040500010106-01	Includes: Sauk River	Fish and Water
040500010107-01	Includes: Coldwater River	Fish and Water
040500010108-01	Includes: Cold Creek and Coldwater River	Fish and Water
040500010109-01	Includes: Bagley Creek, Bowen Creek and South Branch Hog Creek	Fish and Water
040500010110-01	Includes: Hog Creek	Fish and Water
040500010110-02	Includes: North Branch Hog Creek	Fish and Water
040500010111-01	Includes: Coldwater River	Fish and Water
040500010201-01	Includes: Beebe Creek and Shull Drain	Fish and Water
040500010202-01	Includes: Beebe Creek	Fish and Water
040500010203-01	Includes: Boot Lake Outlet, Fourth Lake Outlet, and Unnamed Tributary to Baw Beese (First) Lake	Fish and Water
040500010203-02	Includes: Saint Joseph River	Fish and Water
040500010203-05	Includes: Baw Beese (First) Lake Outlet, King Lake Outlet, and Unnamed Tributary to King Lake	Fish and Water
040500010204-01	Includes: Unnamed Tributaries to Middle Sand Lake, North Sand Lake, and South Land Lake	Fish and Water
040500010204-02	Includes: Sand Creek	Fish and Water
040500010205-01	Includes: Saint Joseph River and Sand Creek	Fish and Water
040500010205-02	Includes: Soap Creek	Fish and Water
040500010205-03	Includes: Saint Joseph River	Fish and Water
040500010206-01	Includes: Saint Joseph River	Fish and Water
040500010207-01	Includes: Tekonsha Creek	Fish and Water
040500010208-01	Includes: Saint Joseph River	Fish and Water
040500010209-01	Includes: Saint Joseph River	Fish and Water
040500010301-01	Includes: Goose Pond Drain, Nottawa Drain, Unnamed Tributary to Klingaman Lake, Unnamed Tributary to Nottawa Drain, and Unnamed Tributary to Nottawa Lake	Fish and Water
040500010302-01	Includes: Nottawa Creek	Fish and Water
040500010303-01	Includes: Alder Creek	Fish and Water
040500010304-01	Includes: Unnamed Tributaries to Nottawa Creek	Fish and Water
040500010304-02	Includes: Pine Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500010305-01	Includes: Bear Creek and Unnamed Tributaries to Bear Creek	Fish and Water
040500010306-02	Includes: Nottawa Creek	Fish and Water
040500010306-03	Includes: Nottawa Creek	Fish and Water
040500010401-01	Includes: Swan Creek	Fish and Water
040500010402-01	Includes: Little Swan Creek	Fish and Water
040500010403-01	Includes: Riley Creek, Saint Joseph River and Spencer Creek	Fish and Water
040500010404-01	Includes: Swan Creek	Fish and Water
040500010404-05	Includes: Swan Creek	Fish and Water
040500010404-06	Includes: Swan Creek	Fish and Water
040500010405-01	Includes: Saint Joseph River	Fish and Water
040500010406-01	Includes: Ainsley Drain, McCauley Drain, and Unnamed Tributary near Covey Road	Fish and Water
040500010406-02	Includes: Saint Joseph River	Fish and Water
040500010501-01	Includes: Portage River	Fish and Water
040500010502-01	Includes: Gourdneck Creek	Fish and Water
040500010502-08	Includes: Gourdneck Creek	Fish and Water
040500010503-03	Includes: Gourdneck Creek and Portage Creek	Fish and Water
040500010503-04	Includes: Portage Creek	Fish and Water
040500010504-01	Includes: Bear Creek and Butternut Creek	Fish and Water
040500010505-01	Includes: Portage River	Fish and Water
040500010505-03	Includes: Dorrance Creek	Fish and Water
040500010505-04	Includes: Portage River	Fish and Water
040500010506-03	Includes: GOOSE LAKE DRAIN	Fish and Water
040500010506-04	Includes: Garman Foster Drain	Fish and Water
040500010506-05	Includes: Portage River	Fish and Water
040500010601-01	Includes: Flowerfield Creek	Fish and Water
040500010602-01	Includes: FLOWERFIELD CREEK	Fish and Water
040500010603-01	Includes: Unnamed Tributaries to Bogart Lake and Unnamed Tributaries to Rocky River	Fish and Water
040500010603-02	Includes: Rocky River	Fish and Water
040500010604-01	Includes: Flowerfield Creek and Spring Creek	Fish and Water
040500010605-02	Includes: Rocky River	Fish and Water
040500010605-04	Includes: Sheldon Creek	Fish and Water
040500010605-05	Includes: FOUR COUNTY DRAIN	Fish and Water
040500010606-01	Includes: Armalege Drain, Kerr Creek and Rocky River	Fish and Water
040500010702-01	Includes: Prairie River	Fish and Water
040500010703-01	Includes: Stewart Lake Creek and Unnamed Tributaries to Prairie River	Fish and Water
040500010703-02	Includes: Prairie River	Fish and Water
040500010703-03	Includes: Prairie River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500010704-01	Includes: Bryant Lake Outlet, Perrin Lake Outlet, Unnamed Tributaries to Prairie River, and Unnamed Tributaries to Eight Foot Lake, Fish Lake, Grey Lake, Hawkins Lake, and Omena Lake	Fish and Water
040500010704-03	Includes: Prairie River	Fish and Water
040500010705-01	Includes: Spring Creek	Fish and Water
040500010705-02	Includes: Spring Creek	Fish and Water
040500010706-01	Includes: Unnamed Tributary to Prairie River	Fish and Water
040500010706-04	Includes: Prairie River	Fish and Water
040500010707-01	Includes: Prairie River	Fish and Water
040500010808-01	Includes: Sherman Mill Creek	Fish and Water
040500010809-01	Includes: Fawn River	Fish and Water
040500010901-01	Includes: Little Portage Creek	Fish and Water
040500010902-01	Includes: Little Portage Creek	Fish and Water
040500010903-01	Includes: Saint Joseph River	Fish and Water
040500010903-02	Includes: Saint Joseph River	Fish and Water
040500010904-01	Includes: Saint Joseph River	Fish and Water
040500010904-03	Includes: Saint Joseph River	Fish and Water
040500011301-01	Includes: Mill Creek and Profile Lake Drain	Fish and Water
040500011302-01	Includes: Mill Creek	Fish and Water
040500011303-01	Includes: Mud Creek and Trout Creek	Fish and Water
040500011304-01	Includes: Black Run and Saint Joseph River	Fish and Water
040500011401-01	Includes: Christiana Creek	Fish and Water
040500011402-01	Includes: Christiana Creek	Fish and Water
040500012301-01	Includes: Dowagiac Drain, Red Run, Unnamed Tributaries to Dowagiac Drain, and Unnamed Tributary to Lake of the Woods	Fish and Water
040500012301-02	Includes: Dowagiac River	Fish and Water
040500012301-04	Includes: Lake of the Woods Drain	Fish and Water
040500012302-01	Includes: Priest Lake Outlet and Silver Creek	Fish and Water
040500012303-01	Includes: DOWAGIAC CREEK	Fish and Water
040500012304-01	Includes: Dowagiac Creek	Fish and Water
040500012305-01	Includes: Dowagiac River	Fish and Water
040500012305-02	Includes: Osborn Drain	Fish and Water
040500012305-03	Includes: Unnamed Tributary to Dowagiac River	Fish and Water
040500012306-01	Includes: Pokagon Creek	Fish and Water
040500012307-01	Includes: Dowagiac River	Fish and Water
040500012307-02	Includes: Dowagiac River	Fish and Water
040500012307-03	Includes: Peavine Creek and Unnamed Tributaries to Peavine Creek	Fish and Water
040500012308-01	Includes: Unnamed Tributary to McKinzie Creek	Fish and Water
040500012308-02	Includes: McKinzie Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500012308-03	Includes: Dowagiac River	Fish and Water
040500012308-04	Includes: McKinzie Creek	Fish and Water
040500012401-01	Includes: Gates Extension Drain, Lawton Drain and South Branch Paw Paw River	Fish and Water
040500012402-01	Includes: East Branch Paw Paw River	Fish and Water
040500012403-01	Includes: North Branch Paw Paw River	Fish and Water
040500012403-03	Includes: Campbell Creek	Fish and Water
040500012404-01	Includes: Brandywine Creek and North Extension Drain	Fish and Water
040500012405-01	Includes: South Branch Paw Paw River from the Three Mile Lake Drain confluence to 60th Avenue, including Three Mile Lake Drain	Fish and Water
040500012405-06	Includes: South Branch Paw Paw River upstream to 60th Avenue	Fish and Water
040500012405-08	Includes: South Branch Paw Paw River downstream to Three Mile Lake Drain	Fish and Water
040500012405-09	Includes: Eagle Lake Drain	Fish and Water
040500012406-01	Includes: North Branch Paw Paw River and Paw Paw River	Fish and Water
040500012406-02	Includes: Hayden Creek and Unnamed Tributary to Hayden Creek	Fish and Water
040500012501-02	Includes: Brush Creek, Red Creek and White Creek	Fish and Water
040500012502-01	Includes: Carter Creek and Paw Paw River	Fish and Water
040500012503-03	Includes: Mud Lake Drain, Unnamed Tributaries to Mud Lake Drain, and Unnamed Tributaries to Sassafras Lake and Van Auken Lake	Fish and Water
040500012504-02	Includes: Hog Creek	Fish and Water
040500012504-03	Includes: Paw Paw River	Fish and Water
040500012505-02	Includes: Paw Paw Lake Outlet, Unnamed Tributaries to Little Paw Paw Lake and Paw Paw Lake	Fish and Water
040500012506-01	Includes: Mill Creek	Fish and Water
040500012506-02	Includes: Mill Creek	Fish and Water
040500012507-01	Includes: Paw Paw River and Ryno Drain	Fish and Water
040500012507-02	Includes: Pine Creek from the Paw Paw River confluence upstream to 66th Avenue.	Fish and Water
040500012507-03	Includes: Pine Creek from 66th Ave upstream to headwaters.	Fish and Water
040500012508-01	Includes: Blue Creek and Yellow Creek	Fish and Water
040500012509-02	Includes: Ox Creek	Fish and Water
040500012602-01	Includes: Saint Joseph River and Spring Valley Drain	Fish and Water
040500012603-01	Includes: Grey Run Drain, Painter Creek and Saint Joseph River	Fish and Water
040500012604-01	Includes: Love Creek and Saint Joseph River	Fish and Water
040500012604-02	Includes: Eau Claire Extension Drain	Fish and Water
040500012604-03	Includes: Farmers Creek	Fish and Water
040500012604-04	Includes: Farmers Creek	Fish and Water
040500012604-05	Includes: Lemon Creek	Fish and Water
040500012605-01	Includes: Pipestone Creek	Fish and Water
040500012605-02	Includes: Pipestone Creek	Fish and Water
040500012606-01	Includes: Love Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500012606-02	Includes: Love Creek and Saint Joseph River	Fish and Water
040500012607-01	Includes: Hickory Creek, Lemon Creek and North Branch Hickory Creek	Fish and Water
040500012608-01	Includes: Saint Joseph River	Fish and Water
040500012608-03	Includes: BIG MEADOW DRAIN	Fish and Water
040500020302-01	Includes: Unnamed Tributary to Bass Creek and Unnamed Tributary to Pigeon River	Fish and Water
040500030101-01	Includes: Unnamed Tributaries to Farewell Lake	Fish and Water
040500030102-01	Includes: SPRING ARBOR and CONCORD DRAIN	Fish and Water
040500030203-01	Includes: Unnamed Tributary near Hanover Road	Fish and Water
040500030203-03	Includes: Beaver Creek and Unnamed Tributaries to Beaver Creek	Fish and Water
040500030203-04	Includes: Conger Drain and Unnamed Tributary to Conger Drain	Fish and Water
040500030204-03	Includes: Swains Lake Drain	Fish and Water
040500030301-01	Includes: Duck Lake Outlet and Unnamed Tributary to Narrow Lake	Fish and Water
040500030301-02	Includes: Battle Creek	Fish and Water
040500030302-01	Includes: Battle Creek	Fish and Water
040500030303-01	Includes: Big Creek	Fish and Water
040500030304-01	Includes: Indian Creek	Fish and Water
040500030305-01	Includes: Indian Creek	Fish and Water
040500030306-01	Includes: Battle Creek	Fish and Water
040500030306-02	Includes: Battle Creek	Fish and Water
040500030307-01	Includes: Battle Creek	Fish and Water
040500030307-02	Includes: TOWNLINE BROOK DRAIN	Fish and Water
040500030308-01	Includes: Ackley Creek and Battle Creek	Fish and Water
040500030308-03	Includes: Ackley Creek	Fish and Water
040500030309-01	Includes: Battle Creek	Fish and Water
040500030310-01	Includes: Wanadoga Creek	Fish and Water
040500030310-02	Includes: Ellis Creek	Fish and Water
040500030311-01	Includes: Wanadoga Creek	Fish and Water
040500030311-02	Includes: Wanadoga Creek	Fish and Water
040500030311-03	Includes: Crooked Brook	Fish and Water
040500030312-01	Includes: Battle Creek	Fish and Water
040500030312-02	Includes: Battle Creek	Fish and Water
040500030401-01	Includes: South Branch Rice Creek	Fish and Water
040500030402-01	Includes: South Branch Rice Creek	Fish and Water
040500030403-01	Includes: North Branch Rice Creek	Fish and Water
040500030403-03	Includes: North Branch Rice Creek	Fish and Water
040500030404-01	Includes: Wilder Creek	Fish and Water
040500030405-01	Includes: Rice Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500030405-02	Includes: Unnamed Tributary to Rice Creek	Fish and Water
040500030407-03	Includes: Bear Creek	Fish and Water
040500030407-04	Includes: Talmadge Creek	Fish and Water
040500030407-05	Includes: SQUAW LAKE DRAIN	Fish and Water
040500030408-01	Includes: Kalamazoo River upstream to the Ceresco Imoundment	Fish and Water
040500030408-03	Includes: Unnamed Tributary to Kalamazoo River	Fish and Water
040500030408-04	Includes: Easterly Dibble Drain	Fish and Water
040500030408-05	Includes: Pigeon Creek	Fish and Water
040500030408-06	Includes: Crooked Creek	Fish and Water
040500030409-01	Includes: Severence Creek	Fish and Water
040500030409-02	Includes: Barnum Creek and Harper Creek	Fish and Water
040500030410-01	Includes: Minges Brook	Fish and Water
040500030410-02	Includes: Brickyard Creek	Fish and Water
040500030411-01	Includes: Dickinson Creek	Fish and Water
040500030411-02	Includes: Kalamazoo River and Willow Creek	Fish and Water
040500030501-01	Includes: Wabascon Creek	Fish and Water
040500030501-02	Includes: Wabascon Creek	Fish and Water
040500030502-01	Includes: Wabascon Creek	Fish and Water
040500030503-01	Includes: Kalamazoo River	Fish and Water
040500030503-02	Includes: MARSH DRAIN	Fish and Water
040500030504-01	Includes: Sevenmile Creek	Fish and Water
040500030504-02	Includes: Sevenmile Creek	Fish and Water
040500030504-03	Includes: Spring Brook	Fish and Water
040500030505-01	Includes: Augusta Creek	Fish and Water
040500030506-01	Includes: Augusta Creek	Fish and Water
040500030507-01	Includes: Unnamed Tributary to Gull Lake	Fish and Water
040500030507-06	Includes: Gull Creek	Fish and Water
040500030508-01	Includes: Kalamazoo River	Fish and Water
040500030508-05	Includes: Unnamed Tributary to Kalamazoo River	Fish and Water
040500030509-01	Includes: Kalamazoo River	Fish and Water
040500030601-01	Includes: Comstock Creek	Fish and Water
040500030601-02	Includes: Comstock Creek	Fish and Water
040500030602-01	Includes: West Fork Portage Creek	Fish and Water
040500030603-01	Includes: Portage Creek	Fish and Water
040500030603-02	Includes: Portage Creek downstream of Monarch Pond to the Kalamazoo River confluence, including Bryant Mill Pond	Fish and Water
040500030603-03	Includes: Portage Creek	Fish and Water
040500030603-04	Includes: Portage Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500030604-01	Includes: Kalamazoo River	Fish and Water
040500030604-02	Includes: Davis Creek from Kalamazoo River confluence to Cork Street	Fish and Water
040500030604-03	Includes: Davis Creek from Cork Street upstream	Fish and Water
040500030605-01	Includes: Spring Brook	Fish and Water
040500030606-01	Includes: Kalamazoo River	Fish and Water
040500030606-03	Includes: Kalamazoo River	Fish and Water
040500030607-01	Includes: Kalamazoo River	Fish and Water
040500030607-02	Includes: Unnamed Tributary to Kalamazoo River	Fish and Water
040500030607-03	Includes: Unnamed Tributary to Kalamazoo River	Fish and Water
040500030607-04	Includes: Silver Creek	Fish and Water
040500030607-05	Includes: Unnamed Tributary to Kalamazoo River	Fish and Water
040500030701-11	Includes: Barlow Lake Outlet, Cobb Lake Outlet, Fawn Lake Outlet, Mill Pond Outlet, and Unnamed Tributaries to Baker Lake, Boot Lake, Chief Noonday Lake, Gun Lake, Payne Lake, and Williams Lake	Fish and Water
040500030702-02	Includes: Lake Sixteen Outlet	Fish and Water
040500030702-03	Includes: Fenner Creek	Fish and Water
040500030702-04	Includes: Greggs Brook	Fish and Water
040500030702-05	Includes: Gun River	Fish and Water
040500030702-06	Includes: Gun River and Orangeville Creek	Fish and Water
040500030702-07	Includes: Orangeville Creek	Fish and Water
040500030702-09	Includes: Unnamed Tributary to Gun River and Unnamed Tributaries to Adams Lake, Crystal Lake, Fish Lake, Horseshoe Lake, and Lime Lake	Fish and Water
040500030703-01	Includes: Gun River	Fish and Water
040500030801-01	Includes: GREEN LAKE CREEK	Fish and Water
040500030801-02	Includes: Tollenbar Drain	Fish and Water
040500030802-01	Includes: Rabbit River and Hooker and Harvey Drain.	Fish and Water
040500030803-02	Includes: Miller Creek	Fish and Water
040500030803-04	Includes: Miller Creek	Fish and Water
040500030804-01	Includes: Bear Creek	Fish and Water
040500030805-01	Includes: Rabbit River	Fish and Water
040500030805-02	Includes: Buskirk Creek	Fish and Water
040500030805-03	Includes: Silkirk Creek and other tributaries to the Rabbit River.	Fish and Water
040500030806-02	Includes: Red Run	Fish and Water
040500030806-03	Includes: Dorr and Byron Drain and Unnamed Tributaries to Dorr and Byron Drain	Fish and Water
040500030807-01	Includes: Little Rabbit River	Fish and Water
040500030808-01	Includes: Rabbit River	Fish and Water
040500030808-02	Includes: Pigeon and Fiest Creek	Fish and Water
040500030809-01	Includes: Black Creek	Fish and Water
040500030810-01	Includes: Rabbit River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500030810-02	Includes: Silver Creek	Fish and Water
040500030810-03	Includes: Miller Creek	Fish and Water
040500030810-04	Includes: Unnamed Tributaries to Rabbit River	Fish and Water
040500030811-01	Includes: Rabbit River	Fish and Water
040500030811-05	Includes: Lohman Drain, Lugten Drain, Unnamed Tributaries to Lohman Drain, and Unnamed Tributaries to Rabbit River	Fish and Water
040500030901-01	Includes: Pine Creek and Sand Creek	Fish and Water
040500030902-02	Includes: Base Line Creek	Fish and Water
040500030903-01	Includes: Base Line Creek and Pine Creek	Fish and Water
040500030904-02	Includes: Miner Creek	Fish and Water
040500030904-03	Includes: School Section Brook	Fish and Water
040500030904-04	Includes: Schnable Brook	Fish and Water
040500030904-05	Includes: Unnamed Tributaries to Miner Lake	Fish and Water
040500030905-01	Includes: Osgood Drain	Fish and Water
040500030905-02	Includes: Kalamazoo River and Pine Creek	Fish and Water
040500030906-01	Includes: Kalamazoo River	Fish and Water
040500030907-01	Includes: Kalamazoo River	Fish and Water
040500030907-02	Includes: Dumont Creek and Kalamazoo River	Fish and Water
040500030907-03	Includes: Rossman Creek and Unnamed Tributaries to Rossman Creek	Fish and Water
040500030907-05	Includes: Dumont Creek	Fish and Water
040500030908-04	Includes: Swan Creek	Fish and Water
040500030908-07	Includes: Swan Creek	Fish and Water
040500030909-01	Includes: Kalamazoo River	Fish and Water
040500030909-02	Includes: Bear Creek	Fish and Water
040500030909-03	Includes: Sand Creek	Fish and Water
040500030909-04	Includes: Unnamed Tributary to Unnamed Lake	Fish and Water
040500030910-01	Includes: Mann Creek	Fish and Water
040500030911-01	Includes: Kalamazoo River	Fish and Water
040500030911-03	Includes: Kalamazoo River	Fish and Water
040500030912-06	Includes: Silver Creek	Fish and Water
040500040101-01	Includes: Unnamed Tributary to Willow Creek and Unnamed Tributaries to Little Wolf Lake and Wolf Lake	Fish and Water
040500040102-01	Includes: Grass Lake Drain, Unnamed Tributaries to Grass Lake Drain, Unnamed Tributaries to Center Lake, Grass Lake, Leoni Millpond, and Tims Lake	Fish and Water
040500040103-01	Includes: North Branch Grand River from confluence with Main Branch of Grand River to Center Lake outlet, and Unnamed Tributary to Little Olcott Lake	Fish and Water
040500040103-05	Includes: Unnamed Tributary to Gilletts Lake	Fish and Water
040500040104-01	Includes: Grand River	Fish and Water
040500040105-01	Includes: Grand River and Sharp Creek	Fish and Water
040500040106-01	Includes: Grand River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500040106-03	Includes: Grand River	Fish and Water
040500040201-01	Includes: Cahaogan Creek	Fish and Water
040500040202-01	Includes: Portage River	Fish and Water
040500040203-01	Includes: Thornapple Creek	Fish and Water
040500040204-01	Includes: Honey Creek and Portage River	Fish and Water
040500040205-01	Includes: Batteese Creek	Fish and Water
040500040206-01	Includes: Batteese Creek and Portage River	Fish and Water
040500040207-01	Includes: Portage River and Wildcat Creek	Fish and Water
040500040208-01	Includes: Huntoon Creek	Fish and Water
040500040209-01	Includes: Grand River, Pleasant Lake Drain, Shaw Branch, Western Creek and Whitney Drain	Fish and Water
040500040210-01	Includes: Albrow Creek and Grand River	Fish and Water
040500040210-02	Includes: Albrow Creek	Fish and Water
040500040301-01	Includes: Sandstone Creek	Fish and Water
040500040302-01	Includes: Mackey Brook and Sandstone Creek	Fish and Water
040500040303-01	Includes: Sandstone Creek	Fish and Water
040500040304-01	Includes: North Onondaga Drain	Fish and Water
040500040305-01	Includes: Otter Creek and Spring Brook	Fish and Water
040500040306-01	Includes: Spring Brook and Willow Creek	Fish and Water
040500040307-01	Includes: Booth Drain and Spring Brook	Fish and Water
040500040307-02	Includes: Spring Brook	Fish and Water
040500040308-01	Includes: Grand River and Spring Brook	Fish and Water
040500040308-02	Includes: Grand River	Fish and Water
040500040401-01	Includes: Red Cedar River	Fish and Water
040500040401-02	Includes: Red Cedar River	Fish and Water
040500040402-01	Includes: Middle Branch Red Cedar River	Fish and Water
040500040403-01	Includes: Red Cedar River	Fish and Water
040500040403-02	Includes: Red Cedar River	Fish and Water
040500040404-01	Includes: West Branch Red Cedar River	Fish and Water
040500040405-01	Includes: West Branch Red Cedar River	Fish and Water
040500040405-02	Includes: West Branch Red Cedar River	Fish and Water
040500040406-01	Includes: Kalamink Creek	Fish and Water
040500040407-01	Includes: Red Cedar River	Fish and Water
040500040407-02	Includes: Wolf Creek	Fish and Water
040500040408-01	Includes: Doan Creek	Fish and Water
040500040409-01	Includes: Dietz Creek	Fish and Water
040500040410-01	Includes: Doan Creek and Doan Deer Creek	Fish and Water
040500040411-01	Includes: Red Cedar River and Sullivan Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500040411-02	Includes: Red Cedar River	Fish and Water
040500040411-03	Includes: Squaw Creek	Fish and Water
040500040501-01	Includes: Deer Creek	Fish and Water
040500040502-01	Includes: Sloan Creek	Fish and Water
040500040502-02	Includes: Sloan Creek	Fish and Water
040500040503-01	Includes: Unnamed Tributary to Red Cedar River	Fish and Water
040500040503-02	Includes: Deer Creek	Fish and Water
040500040503-03	Includes: Coon Creek and Red Cedar River	Fish and Water
040500040504-01	Includes: Pine Lake Outlet	Fish and Water
040500040505-01	Includes: Mud Creek	Fish and Water
040500040506-01	Includes: Talmadge Drain and Sycamore Creek	Fish and Water
040500040506-04	Includes: Cook and Thorburn Drain from Cedar Lake upstream	Fish and Water
040500040507-01	Includes: Banta Drain and Sycamore Creek	Fish and Water
040500040508-01	Includes: Herron Creek	Fish and Water
040500040508-02	Includes: Red Cedar River	Fish and Water
040500040508-03	Includes: Red Cedar River	Fish and Water
040500040601-01	Includes: Looking Glass River	Fish and Water
040500040602-01	Includes: Grub Creek and Looking Glass River	Fish and Water
040500040603-02	Includes: Osborn Creek and Looking Glass River	Fish and Water
040500040603-03	Includes Perry Drain No. 2 and Austin Drain (Kellogg Drain)	Fish and Water
040500040604-01	Includes: Buck Branch and Vermilion Creek	Fish and Water
040500040604-02	Includes: Vermilion Creek and its tributaries downstream to Hidden Lake	Fish and Water
040500040605-03	Includes: Looking Glass River and Vermilion Creek	Fish and Water
040500040606-02	Includes: Looking Glass River	Fish and Water
040500040607-01	Includes: Looking Glass River and Mud Creek	Fish and Water
040500040608-01	Includes: Remy Chandler Drain and Unnamed Tributaries to Remy Chandler Drain	Fish and Water
040500040609-01	Includes: Ives Drain and Looking Glass River	Fish and Water
040500040609-03	Includes: Clise Drain	Fish and Water
040500040610-01	Includes: Looking Glass River, Prairie Creek, and Watson and Summers Drain.	Fish and Water
040500040611-01	Includes: Looking Glass River and Husted and Landenberg Drain	Fish and Water
040500040612-02	Includes: Looking Glass River, McCausey Branch, and Kramer Drain	Fish and Water
040500040701-01	Includes: Columbia Creek	Fish and Water
040500040702-01	Includes: Grand River, Harris Drain, Skinner Extension Drain and Spicer Creek	Fish and Water
040500040703-01	Includes: Grand River and Silver Creek	Fish and Water
040500040704-01	Includes: Unnamed Tributaries to the Grand River	Fish and Water
040500040704-02	Includes: Carrier Creek	Fish and Water
040500040704-03	Includes: Grand River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500040705-01	Includes: Miller Creek	Fish and Water
040500040705-02	Includes: Grand River	Fish and Water
040500040705-03	Includes: Sandstone Creek	Fish and Water
040500040706-01	Includes: Grand River	Fish and Water
040500040706-03	Includes: Frayer Creek and Grand River	Fish and Water
040500040707-01	Includes: Sebewa Creek	Fish and Water
040500040708-01	Includes: Sebewa Creek	Fish and Water
040500040709-01	Includes: Grand River	Fish and Water
040500040710-01	Includes: Friend Brook and Grand River	Fish and Water
040500040710-02	Includes: Goose Creek	Fish and Water
040500050101-01	Includes: Maple River and Spring Brook	Fish and Water
040500050102-01	Includes: Bear Creek and Coon Creek	Fish and Water
040500050103-01	Includes: Alder Creek and Alder Creek Drain	Fish and Water
040500050103-02	Includes: Alder Creek Drain	Fish and Water
040500050104-01	Includes: Little Maple River	Fish and Water
040500050104-02	Includes: Little Maple River	Fish and Water
040500050105-01	Includes: Unnamed Tributaries to Maple River	Fish and Water
040500050105-02	Includes: Maple River	Fish and Water
040500050105-03	Includes: Maple River	Fish and Water
040500050201-01	Includes: Baker Creek and Wise Creek	Fish and Water
040500050202-01	Includes: Maple River	Fish and Water
040500050202-02	Includes: Maple River	Fish and Water
040500050202-03	Includes: Maple River	Fish and Water
040500050203-01	Includes: Bear Creek	Fish and Water
040500050204-01	Includes: Halterman Creek	Fish and Water
040500050204-02	Includes: Ferdon Creek and Maple River	Fish and Water
040500050204-03	Includes: Maple River	Fish and Water
040500050205-01	Includes: Unnamed Tributaries to Pine Creek	Fish and Water
040500050205-02	Includes: Newark Drain	Fish and Water
040500050205-03	Includes: River Styx	Fish and Water
040500050205-04	Includes: Pine Creek	Fish and Water
040500050206-01	Includes: Knowles Drain, North Shade Drain, and Unnamed Tributaries to North Shade Drain	Fish and Water
040500050207-01	Includes: Pine Creek	Fish and Water
040500050207-02	Includes: Pine Creek	Fish and Water
040500050207-03	Includes: Otter Creek	Fish and Water
040500050208-01	Includes: Maple River	Fish and Water
040500050208-02	Includes: Collier Creek and Maple River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500050301-01	Includes: Holland Lake Outlet and Unnamed Tributaries to Lampman Lake, Mitchell Lake, Rosa Lake, Twin Lakes, and Twin Stone Lakes	Fish and Water
040500050301-04	Includes: West Branch Fish Creek	Fish and Water
040500050302-01	Includes: Fish Creek	Fish and Water
040500050303-01	Includes: Unnamed Tributary to Fish Creek	Fish and Water
040500050304-01	Includes: Butternut Creek	Fish and Water
040500050305-02	Includes: Fish Creek	Fish and Water
040500050305-03	Includes: Fish Creek	Fish and Water
040500050306-01	Includes: Fifield Creek	Fish and Water
040500050306-02	Includes: Fish Creek and Stoughton Creek	Fish and Water
040500050306-03	Includes: Stoughton Creek	Fish and Water
040500050401-01	Includes: Stony Creek	Fish and Water
040500050401-02	Includes: Stony Creek	Fish and Water
040500050402-01	Includes: Bad Creek	Fish and Water
040500050403-01	Includes: Hamilton Drain, Holden Drain and Stony Creek	Fish and Water
040500050404-01	Includes: Muskrat Creek and Tibbetts Drain	Fish and Water
040500050405-01	Includes: Kloeckner and Fuller Creek and Stony Creek	Fish and Water
040500050406-01	Includes: Stony Creek	Fish and Water
040500050406-02	Includes: Lost Creek	Fish and Water
040500050406-03	Includes: Stony Creek	Fish and Water
040500050501-01	Includes: Unnamed Tributaries to North Swargart Creek	Fish and Water
040500050501-02	Includes: Kneeland Branch and South Fork Hayworth Creek	Fish and Water
040500050502-01	Includes: Unnamed Tributaries to Hayworth Creek	Fish and Water
040500050502-02	Includes: Hayworth Creek	Fish and Water
040500050502-03	Includes: Doty Brook	Fish and Water
040500050503-01	Includes: Hayworth Creek	Fish and Water
040500050503-02	Includes: Peet Creek	Fish and Water
040500050503-03	Includes: Cox Drain and Unnamed Tributary to Cox Drain	Fish and Water
040500050504-01	Includes: Maple River	Fish and Water
040500050505-01	Includes: Maple River	Fish and Water
040500060101-01	Includes: Black Creek	Fish and Water
040500060102-01	Includes: Stony Creek	Fish and Water
040500060102-02	Includes: Unnamed Tributary to Sixth Lake	Fish and Water
040500060103-01	Includes: Brimmer Creek, Flat River, Horseshoe Creek, Townline Creek and Wolf Creek	Fish and Water
040500060103-02	Includes: Unnamed Tributary to Little Penny Lake	Fish and Water
040500060104-01	Includes: Flat River	Fish and Water
040500060104-02	Includes: Unnamed Tributary to Flat River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500060105-02	Includes: Flat River	Fish and Water
040500060106-01	Includes: Black Creek	Fish and Water
040500060107-01	Includes: Clear Creek	Fish and Water
040500060108-01	Includes: Coopers Creek	Fish and Water
040500060108-02	Includes: Butternut Creek	Fish and Water
040500060108-03	Includes: Coopers Creek	Fish and Water
040500060109-01	Includes: Flat River	Fish and Water
040500060201-01	Includes: Beaver Dam Creek and Wabasis Creek	Fish and Water
040500060201-03	Includes: Wabasis Creek	Fish and Water
040500060201-04	Includes: Beaver Dam Creek	Fish and Water
040500060202-01	Includes: Unnamed Tributary to Dickerson Lake	Fish and Water
040500060202-05	Includes: Dickerson Creek	Fish and Water
040500060203-01	Includes: Dickerson Creek	Fish and Water
040500060203-02	Includes: TRIBUTARY TO DICKERSON CREEK	Fish and Water
040500060204-01	Includes: Unnamed Tributary to Dickerson Creek and Unnamed Tributary to Long Lake	Fish and Water
040500060205-01	Includes: Dickerson Creek	Fish and Water
040500060206-01	Includes: Flat River	Fish and Water
040500060206-02	Includes: Flat River	Fish and Water
040500060207-01	Includes: Seely Creek	Fish and Water
040500060207-04	Includes: Seely Creek	Fish and Water
040500060208-01	Includes: Flat River	Fish and Water
040500060209-01	Includes: Flat River	Fish and Water
040500060209-02	Includes: Page Creek	Fish and Water
040500060301-01	Includes: Libhart Creek	Fish and Water
040500060302-01	Includes: Libhart Creek	Fish and Water
040500060302-02	Includes: Ayers Branch and Little Libhart Creek	Fish and Water
040500060302-03	Includes: Libhart Creek	Fish and Water
040500060303-01	Includes: Bacon Creek and Prairie Creek	Fish and Water
040500060304-01	Includes: Prairie Creek	Fish and Water
040500060304-02	Includes: Prairie Creek	Fish and Water
040500060305-01	Includes: Unnamed Tributary to Prairie Creek and Unnamed Tributary near Meade Road	Fish and Water
040500060306-01	Includes: Prairie Creek	Fish and Water
040500060307-01	Includes: Grand River	Fish and Water
040500060308-01	Includes: Sessions Creek	Fish and Water
040500060308-03	Includes: Sessions Creek	Fish and Water
040500060308-04	Includes: Sessions Creek	Fish and Water
040500060309-01	Includes: Bellamy Creek, Grand River and Tibbetts Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500060309-02	Includes: Bellamy Creek	Fish and Water
040500060310-01	Includes: Grand River	Fish and Water
040500060310-02	Includes: Crooked Creek	Fish and Water
040500060310-03	Includes: Red Creek	Fish and Water
040500060310-04	Includes: Timberland Creek	Fish and Water
040500060311-01	Includes: Leary Drain, Unnamed Tributary to Morrison Lake, and Unnamed Tributary near Clarksville Road	Fish and Water
040500060311-02	Includes: Lake Creek and Little Creek	Fish and Water
040500060312-01	Includes: Grand River	Fish and Water
040500060312-02	Includes: Toles Creek	Fish and Water
040500060313-01	Includes: Grand River	Fish and Water
040500060313-02	Includes: Lee Creek	Fish and Water
040500060313-03	Includes: Unnamed Tributary to Grand River	Fish and Water
040500060313-04	Includes: Unnamed Tributary to Grand River	Fish and Water
040500060401-02	Includes: Rogue River (Ransom Creek)	Fish and Water
040500060401-04	Includes: Hickory Creek	Fish and Water
040500060402-01	Includes: Duke Creek	Fish and Water
040500060402-02	Includes: Duke Creek and Forest Creek	Fish and Water
040500060402-03	Includes: White Creek	Fish and Water
040500060402-04	Includes: Frost Creek	Fish and Water
040500060403-01	Includes: Walter Creek	Fish and Water
040500060403-02	Includes: Spring Creek	Fish and Water
040500060403-03	Includes: Rogue River	Fish and Water
040500060404-01	Includes: Nash Creek	Fish and Water
040500060405-02	Includes: Ball Creek	Fish and Water
040500060405-05	Includes: Rogue River	Fish and Water
040500060406-02	Includes: Cedar Creek and Unnamed Tributary to Cedar Creek	Fish and Water
040500060406-03	Includes: Little Cedar Creek	Fish and Water
040500060407-01	Includes: Rogue River	Fish and Water
040500060407-02	Includes: Unnamed Tributary near US 131	Fish and Water
040500060408-01	Includes: Becker Creek	Fish and Water
040500060408-03	Includes: Stegman Creek	Fish and Water
040500060408-04	Includes: Shaw Creek	Fish and Water
040500060408-05	Includes: Rogue River and Unnamed Tributary to Rogue River	Fish and Water
040500060408-06	Includes: Barkley Creek	Fish and Water
040500060408-07	Includes: Rum Creek	Fish and Water
040500060501-01	Includes: Bear Creek and Waddell Creek	Fish and Water
040500060501-02	Includes: Armstrong Creek, Bear Creek and Stout Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500060502-01	Includes: Bear Creek and Grand River	Fish and Water
040500060502-02	Includes: Honey Creek	Fish and Water
040500060502-03	Includes: Egypt Creek	Fish and Water
040500060502-04	Includes: Unnamed Tributary to Grand River	Fish and Water
040500060502-05	Includes: Sunny Creek	Fish and Water
040500060503-01	Includes: Unnamed Tributary to Mill Creek	Fish and Water
040500060503-02	Includes: Strawberry Creek	Fish and Water
040500060503-03	Includes: Mill Creek	Fish and Water
040500060503-04	Includes: Mill Creek	Fish and Water
040500060504-01	Includes: Brandywine Creek and Indian Mill Creek	Fish and Water
040500060504-02	Includes: Indian Mill Creek	Fish and Water
040500060505-01	Includes: Unnamed Tributaries to Plaster Creek	Fish and Water
040500060505-02	Includes: Plaster Creek	Fish and Water
040500060506-01	Includes: Echo Lake Outlet and Unnamed Tributary to Unnamed Lake	Fish and Water
040500060506-02	Includes: Little Plaster Creek, Plaster Creek and Whisky Creek	Fish and Water
040500060507-01	Includes: Grand River	Fish and Water
040500060507-02	Includes: York Creek	Fish and Water
040500060507-03	Includes: Scott Creek	Fish and Water
040500060507-04	Includes: Lambertson Creek	Fish and Water
040500060507-05	Includes: LAMBERTON CREEK	Fish and Water
040500060507-06	Includes: Grand River	Fish and Water
040500060508-01	Includes: Buck Creek and Sharps Creek	Fish and Water
040500060509-01	Includes: East Branch Rush Creek	Fish and Water
040500060509-02	Includes: East Branch Rush Creek	Fish and Water
040500060510-01	Includes: Unnamed Tributary to Buck Creek	Fish and Water
040500060510-02	Includes: Buck Creek and Pine Hill Creek	Fish and Water
040500060511-01	Includes: Unnamed Tributary to Black (Macatawa) River	Fish and Water
040500060511-02	Includes: Rush Creek	Fish and Water
040500060511-04	Includes: Unnamed Tributary to Rush Creek	Fish and Water
040500060512-01	Includes: Grand River	Fish and Water
040500060512-02	Includes: Unnamed Tributary to Grand River	Fish and Water
040500060512-03	Includes: Grand River	Fish and Water
040500060601-03	Includes: North Branch Crockery Creek	Fish and Water
040500060601-04	Includes: North Branch Crockery Creek	Fish and Water
040500060602-01	Includes: Crockery Creek	Fish and Water
040500060602-04	Includes: Unnamed Tributary to Crockery Creek	Fish and Water
040500060602-05	Includes: Crockery Creek and Ovidhall Lake Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500060602-06	Includes: Crockery Creek	Fish and Water
040500060603-01	Includes: Crockery Creek	Fish and Water
040500060603-02	Includes: Rio Grande Creek	Fish and Water
040500060604-01	Includes: Crockery Creek	Fish and Water
040500060604-02	Includes: Crockery Creek	Fish and Water
040500060605-01	Includes: Brandy Creek and Crockery Creek	Fish and Water
040500060701-01	Includes: East Fork Sand Creek and Unnamed Tributaries to East Fork Sand Creek	Fish and Water
040500060702-01	Includes: Sand Creek	Fish and Water
040500060703-01	Includes: Sand Creek	Fish and Water
040500060704-01	Includes: Beaver Creek, Deer Creek and Little Deer Creek	Fish and Water
040500060705-01	Includes: Grand River	Fish and Water
040500060705-03	Includes: Ottawa Creek	Fish and Water
040500060706-01	Includes: Bass Creek	Fish and Water
040500060707-01	Includes: Bass Creek, Bass River, Bear Creek and Little Bass Creek	Fish and Water
040500060708-01	Includes: Grand River	Fish and Water
040500060710-01	Includes: Norris Creek	Fish and Water
040500060711-02	Includes: Beckwith Brook, Stevens Creek, Vincent Creek and Willow Hill Creek	Fish and Water
040500060711-03	Includes: Norris Creek	Fish and Water
040500070101-01	Includes: Butternut Creek	Fish and Water
040500070102-01	Includes: Thornapple River	Fish and Water
040500070102-02	Includes: Unnamed Tributary to Butternut Creek	Fish and Water
040500070103-01	Includes: Sharp Drain, Thornapple Drain, and Unnamed Tributaries to Thornapple Drain	Fish and Water
040500070104-01	Includes: Little Thornapple River	Fish and Water
040500070105-01	Includes: Thornapple River	Fish and Water
040500070105-02	Includes: Thornapple River	Fish and Water
040500070201-01	Includes: Thornapple River	Fish and Water
040500070201-03	Includes: Darken and Boyer Drain, Cole Wright Helms Drain, and Unnamed Tributaries to Darken and Boyer Drain	Fish and Water
040500070202-01	Includes: Lacey Creek and Unnamed Tributary near Carlisle Highway	Fish and Water
040500070202-02	Includes: Lacey Creek	Fish and Water
040500070203-01	Includes: Thornapple River	Fish and Water
040500070203-02	Includes: Thompson Creek	Fish and Water
040500070204-01	Includes: Hayon Creek and Shanty Brook	Fish and Water
040500070205-01	Includes: Quaker Brook	Fish and Water
040500070206-01	Includes: Scipio Creek	Fish and Water
040500070206-02	Includes: Thornapple River	Fish and Water
040500070207-01	Includes: Mud Creek	Fish and Water
040500070208-01	Includes: Gravel Brook, Hagar Creek and Mud Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500070209-01	Includes: High Bank Creek	Fish and Water
040500070209-02	Includes: Mud Creek	Fish and Water
040500070209-03	Includes: High Bank Creek and Thornapple River	Fish and Water
040500070210-03	Includes: Cedar Creek, Kellie Creek and North Branch Cedar Creek	Fish and Water
040500070211-03	Includes: Thornapple River	Fish and Water
040500070301-01	Includes: Tupper Creek	Fish and Water
040500070302-01	Includes: Little Thornapple River and Woodland Creek	Fish and Water
040500070303-01	Includes: Coldwater River, Kart Creek and Messer Brook	Fish and Water
040500070303-02	Includes: Coldwater River	Fish and Water
040500070304-01	Includes: Duck Creek	Fish and Water
040500070304-02	Includes: Duck Creek	Fish and Water
040500070305-01	Includes: Kilgus Branch	Fish and Water
040500070305-02	Includes: Pratt Lake Creek	Fish and Water
040500070305-03	Includes: Pratt Lake Creek	Fish and Water
040500070306-01	Includes: Bear Creek	Fish and Water
040500070306-02	Includes: Bear Creek	Fish and Water
040500070307-01	Includes: Clarke and Bunker Drain and Unnamed Tributaries to Clarke and Bunker Drain	Fish and Water
040500070307-02	Includes: Coldwater River	Fish and Water
040500070307-03	Includes: Coldwater River	Fish and Water
040500070401-01	Includes: Fall Creek	Fish and Water
040500070402-01	Includes: Thornapple River	Fish and Water
040500070402-02	Includes: Thornapple River	Fish and Water
040500070402-03	Includes: Butler Creek	Fish and Water
040500070402-04	Includes: Pratt Creek and Unnamed Tributary to Pratt Creek	Fish and Water
040500070403-01	Includes: Glass Creek	Fish and Water
040500070404-01	Includes: Thornapple River	Fish and Water
040500070405-01	Includes: Duncan Lake Outlet and Wilson Drain	Fish and Water
040500070405-03	Includes: Hanna Lake Outlet and Unnamed Tributary to Hanna Lake	Fish and Water
040500070405-04	Includes: Duncan Creek	Fish and Water
040500070406-01	Includes: Hill Creek and Thornapple River	Fish and Water
040500070406-02	Includes: Bassett Creek and Turner Creek	Fish and Water
040500070407-01	Includes: Thornapple River	Fish and Water
040500070407-02	Includes: Krafts Lake Outlet	Fish and Water
040500070407-03	Includes: McCords Creek	Fish and Water
040500070407-04	Includes: UNNAMED TRIBUTARY TO THORNAPPLE RIVER	Fish and Water
040500070408-01	Includes: Thornapple River	Fish and Water
040500070408-02	Includes: UNNAMED TRIBUTARY TO THORNAPPLE	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040500070408-03	Includes: Unnamed Tributary to Thornapple River upstream of Gerald Ford Airport	Fish and Water
040601010301-01	Includes: Ewing Creek and McDuffee Creek	Fish and Water
040601010302-01	Includes: Little South Branch Pere Marquette River	Fish and Water
040601010303-01	Includes: Baker Creek, Blood Creek and Middle Branch Pere Marquette River	Fish and Water
040601010303-02	Includes: Middle Branch Pere Marquette River	Fish and Water
040601010304-01	Includes: Little South Branch Pere Marquette River and Pease Creek	Fish and Water
040601010304-02	Includes: Little South Branch Pere Marquette River	Fish and Water
040601010304-03	Includes: Unnamed Rivers/Streams in HUC 040601010304	Fish and Water
040601010401-01	Includes: Beaver Creek	Fish and Water
040601010401-02	Includes: Beaver Creek	Fish and Water
040601010401-03	Includes: Beaver Creek and South Beaver Creek	Fish and Water
040601010402-01	Includes: Tank Creek	Fish and Water
040601010402-02	Includes: West Michigan Creek	Fish and Water
040601010402-03	Includes: Bear Creek	Fish and Water
040601010402-04	Includes: Winnepesaug Creek	Fish and Water
040601010402-05	Includes: Big South Branch Pere Marquette River	Fish and Water
040601010403-01	Includes: Cedar Creek and Triple Lakes Creek	Fish and Water
040601010404-01	Includes: Freeman Creek and Unnamed Tributaries to Freeman Creek	Fish and Water
040601010404-02	Includes: Big South Branch Pere Marquette River	Fish and Water
040601010405-01	Includes: Allen Creek	Fish and Water
040601010405-02	Includes: WOODY CREEK	Fish and Water
040601010405-03	Includes: Big South Branch Pere Marquette River and Ruby Creek	Fish and Water
040601010406-01	Includes: Big South Branch Pere Marquette River	Fish and Water
040601010406-02	Includes: Carr Creek	Fish and Water
040601010501-01	Includes: Baldwin River, Cole Creek, North Branch Cole Creek and South Branch Cole Creek	Fish and Water
040601010502-01	Includes: Sanborn Creek	Fish and Water
040601010503-02	Includes: Baldwin River and Bray Creek	Fish and Water
040601010503-03	Includes: Sanborn Creek	Fish and Water
040601010504-01	Includes: Pere Marquette River	Fish and Water
040601010504-02	Includes: Danaher Creek and Jenks Creek	Fish and Water
040601010504-05	Includes: Pere Marquette River	Fish and Water
040601010505-01	Includes: Sweetwater Creek	Fish and Water
040601010505-02	Includes: Pere Marquette River	Fish and Water
040601010505-03	Includes: Kinney Creek	Fish and Water
040601010505-04	Includes: Tank Creek	Fish and Water
040601010505-05	Includes: Pere Marquette River	Fish and Water
040601010506-01	Includes: Pere Marquette River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040601010506-02	Includes: Pere Marquette River	Fish and Water
040601010506-03	Includes: Weldon Creek	Fish and Water
040601010506-04	Includes: Weldon Creek	Fish and Water
040601010507-01	Includes: Unnamed Tributary to Pere Marquette River	Fish and Water
040601010507-02	Includes: Black Creek and Hatting Creek	Fish and Water
040601010507-03	Includes: Pere Marquette River	Fish and Water
040601010508-01	Includes: Pere Marquette River	Fish and Water
040601010508-02	Includes: Swan Creek	Fish and Water
040601010508-03	Includes: India Creek	Fish and Water
040601010509-01	Includes: Pere Marquette River upstream from Pere Marquette Highway, and Swanson Creek	Fish and Water
040601020903-01	Includes: Muskegon River excluding 1 mile stretch below Croton Dam	Fish and Water
040601020903-05	Includes: Muskegon River from Croton dam downstream 1 mile	Fish and Water
040601020904-01	Includes: Fourmile Creek and Muskegon River	Fish and Water
040601020906-01	Includes: Greenwood Creek and Muskegon River	Fish and Water
040601021002-04	Includes: Maple River, Middle Channel Muskegon River, Mosquito Creek, Muskegon River and Spring Creek	Fish and Water
040601021004-03	Includes: Middle Channel Muskegon River	Fish and Water
040700060605-02	Includes: Fall Creek and Thunder Bay River	Fish and Water
040700070709-01	Includes: Au Sable River below Foote dam and Old Au Sable River	Fish and Water
040801020206-03	Includes: Kawkawlin River and Millpond Drain	Fish and Water
040802010408-01	Includes: Tittabawassee River and Varsity Creek	Fish and Water
040802010408-02	Includes: Black Creek	Fish and Water
040802010601-01	Includes: Carrol Creek Drain	Fish and Water
040802010602-01	Includes: Grass Creek and Sturgeon Creek	Fish and Water
040802010603-01	Includes: Unnamed Tributary to Newell Drain	Fish and Water
040802010603-02	Includes: Branch Number Two, Jacobs Drain, Miller Drain, Newell Drain and Sturgeon Creek	Fish and Water
040802010604-01	Includes: Tittabawassee River upstream from 460 feet downstream of Poseyville Road	Fish and Water
040802010604-02	Includes: Averill Creek, Prairie Creek, and Tittabawassee River	Fish and Water
040802010604-03	Includes: Tittabawassee River downstream from 460 feet downstream of Poseyville Road	Fish and Water
040802010605-01	Includes: Bullock Creek, Duncan Drain, Kneeland Drain, and Unnamed Tributaries to Bullock Creek	Fish and Water
040802010606-01	Includes: Tittabawassee River	Fish and Water
040802010606-02	Includes: Tittabawassee River	Fish and Water
040802010606-03	Includes: Lingle Drain, Sarle Drain, Shaffner Drain, Brown and Mills Drain	Fish and Water
040802010607-01	Includes: Tittabawassee River	Fish and Water
040802010607-02	Includes: Tributaries to the Tittabawassee River	Fish and Water
040802020207-02	Includes: Chippewa River	Fish and Water
040802020207-03	Includes: Chippewa River	Fish and Water
040802020207-04	Includes: Chippewa River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040802020207-05	Includes: Cedar Creek	Fish and Water
040802020501-01	Includes: Chippewa River and Mission Creek	Fish and Water
040802020502-01	Includes: Parcher Drain and Salt Creek	Fish and Water
040802020503-01	Includes: Childs Creek and Salt Creek	Fish and Water
040802020504-01	Includes: Onion Creek and Potter Creek	Fish and Water
040802020504-02	Includes: Potter Creek	Fish and Water
040802020505-01	Includes: Black Creek, Salt Creek and Thrasher Creek	Fish and Water
040802020506-01	Includes: Little Salt Creek	Fish and Water
040802020506-02	Includes: Little Salt Creek	Fish and Water
040802020507-01	Includes: Little Salt Creek and Turkey Creek	Fish and Water
040802020508-01	Includes: Chippewa River	Fish and Water
040802020508-02	Includes: Chippewa River	Fish and Water
040802020508-03	Includes: Chippewa River	Fish and Water
040802020508-04	Includes: Chippewa River	Fish and Water
040802030101-01	Includes: Marion And Genoa Drain and South Branch Shiawassee River	Fish and Water
040802030101-02	Includes: Marion And Genoa Drain	Fish and Water
040802030102-01	Includes: Sprague Creek	Fish and Water
040802030103-01	Includes: South Branch Shiawassee River	Fish and Water
040802030104-01	Includes: Bogue Creek	Fish and Water
040802030110-01	Includes: South Branch Shiawassee River	Fish and Water
040802030111-01	Includes: Shiawassee River	Fish and Water
040802030202-01	Includes: Shiawassee River	Fish and Water
040802030205-01	Includes: Maple River and Shiawassee River	Fish and Water
040802030205-02	Includes: Scribner Drain and Unnamed Tributaries to Scribner Drain	Fish and Water
040802030206-02	Includes: Shiawassee River	Fish and Water
040802030207-01	Includes: Unnamed Tributary to Shiawassee River	Fish and Water
040802030207-02	Includes: Shiawassee River	Fish and Water
040802030208-04	Includes: Shiawassee River	Fish and Water
040802030209-01	Includes: Shiawassee River	Fish and Water
040802030301-01	Includes: Bad River and Brady Creek	Fish and Water
040802030302-01	Includes: Limbocker Creek	Fish and Water
040802030303-01	Includes: South Fork Bad River	Fish and Water
040802030304-01	Includes: Griffus Creek and Lamb Creek	Fish and Water
040802030309-01	Includes: Bad River and Shad Creek	Fish and Water
040802030310-01	Includes: South Fork Bad River	Fish and Water
040802030313-01	Includes: Bad River, Eagle Creek, Little Eagle Creek, Shiawassee River, Soap Run and South Fork Bad River	Fish and Water
040802030410-03	Includes: Shiawassee River	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040802030410-06	Includes: Shiawassee River	Fish and Water
040802040303-07	Includes: Thread Creek	Fish and Water
040802040306-02	Includes: Bush Creek, Pierson Branch and Thread Creek	Fish and Water
040802040409-01	Includes: Flint River	Fish and Water
040802040409-02	Includes: Flint River	Fish and Water
040802040409-03	Includes: POWERS-CULLEN DRAIN	Fish and Water
040802040409-04	Includes: Clark Drain, Flint River, Riegle Drain and Zufelt Drain	Fish and Water
040802040410-01	Includes: Flint River	Fish and Water
040802040410-02	Includes: Gilkey Creek	Fish and Water
040802040501-01	Includes: Cole Creek	Fish and Water
040802040501-02	Includes: Flint River	Fish and Water
040802040501-03	Includes: Mud Creek	Fish and Water
040802040501-05	Includes: Pirnie Creek	Fish and Water
040802040502-01	Includes: Flint River	Fish and Water
040802040502-02	Includes: Brent Creek and Freeman Drain	Fish and Water
040802040503-01	Includes: Brent Run	Fish and Water
040802040504-01	Includes: Armstrong Creek	Fish and Water
040802040504-02	Includes: Flint River	Fish and Water
040802040505-01	Includes: Misteguay Creek and Crawford Creek	Fish and Water
040802040506-01	Includes: Misteguay Creek and Rush Creek	Fish and Water
040802040506-02	Includes: Rush Creek	Fish and Water
040802040506-03	Includes: Onion Creek	Fish and Water
040802040507-01	Includes: Misteguay Creek and Porter Creek	Fish and Water
040802040508-01	Includes: Northwood Creek	Fish and Water
040802040509-01	Includes: Misteguay Creek, Mitchell Creek and Northwood Creek	Fish and Water
040802040510-01	Includes: Benjamin Run, Parker Creek and Pine Run	Fish and Water
040802040511-01	Includes: Alexander Drain, Bogart Drain, Hutchinson And Young Drain, Silver Creek and Silver Creek Drain	Fish and Water
040802040512-01	Includes: Bortle Drain, Misteguay Creek and Pattee Creek	Fish and Water
040802040513-01	Includes: Atwell Drain, Flint River, Pitch Creek and Spring Brook Drain	Fish and Water
040802040513-02	Includes: Flint River	Fish and Water
040802050101-01	Includes: South Branch Cass River	Fish and Water
040802050102-01	Includes: Carter Drain and Unnamed Tributaries to Carter Drain	Fish and Water
040802050102-02	Includes: Duff Creek and South Branch Cass River	Fish and Water
040802050103-01	Includes: South Branch Cass River	Fish and Water
040802050104-01	Includes: Argyle Drain, Carson Drain, Hartel Drain, Middle Branch Cass River and Sanderson Drain	Fish and Water
040802050105-01	Includes: Hawksworth Drain, Kramp Drain, McIntyre Drain, Middle Branch Cass River, Swan Drain and Wheeler Drain	Fish and Water
040802050106-01	Includes: South Branch Cass River and Stony Creek	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040802050106-02	Includes: Ryder Drain and Turtle Creek	Fish and Water
040802050106-03	Includes: Beaver Creek, Kirby Drain, Middle Branch Cass River, South Branch Cass River, Tank Drain and Temple Drain	Fish and Water
040802050107-01	Includes: Brown Drain, Osentoski Branch, Schiestel Drain and South Fork Cass River	Fish and Water
040802050108-01	Includes: North Branch Cass River	Fish and Water
040802050109-01	Includes: North Branch Cass River and Sanilac Huron Creek	Fish and Water
040802050110-01	Includes: Greenman Creek and South Branch Cass River	Fish and Water
040802050205-01	Includes: Cass River	Fish and Water
040802050207-01	Includes: Cass River	Fish and Water
040802050207-02	Includes: Butternut Creek, Cass River, and Tributaries to the Cass River	Fish and Water
040802050208-01	Includes: Cass River	Fish and Water
040802050304-01	Includes: Carpenter Branch, Dead Creek and Zehender Drain	Fish and Water
040802050304-02	Includes: Dead Creek	Fish and Water
040802050305-01	Includes: Cass River and Cole Creek	Fish and Water
040802050305-03	Includes: Cass River	Fish and Water
040802050306-01	Includes: Cass River	Fish and Water
040802050306-03	Includes: Cass River	Fish and Water
040802060101-01	Includes: Cheboyganing Creek, Richville Drain, Rousch Drain, Sheboygan Drain, Tinglan Drain, Unnamed Tributaries to Cheboyganing Creek, Unnamed Tributaries to Richville Drain, Unnamed Tributaries to Rousch Drain, and Unnamed Tributaries to Sheboygan Drain	Fish and Water
040802060102-01	Includes: Blumfield Creek, Cool Creek, Unnamed Tributaries to Blumfield Creek, and Unnamed Tributaries to Cool Creek	Fish and Water
040802060103-02	Includes: Unnamed Tributaries to Weaver Drain and Weaver Drain	Fish and Water
040802060201-01	Includes: Saginaw River and Unnamed Tributaries to Saginaw River	Fish and Water
040802060202-01	Includes: Kochville Drain, Unnamed Tributaries to Kochville Drain, and Unnamed Tributaries to Saginaw River	Fish and Water
040802060203-01	Includes: Armon Drain, Branch Number Three, Colmubia Drain, Dutch Creek, Kochville and Frankenlust Drain, Squaconning Creek, Unnamed Tributaries to Dutch Creek, Unnamed Tributaries to North Branch Kochville and Frankenlust Drain, and Unnamed Tributaries t	Fish and Water
040802060204-03	Includes: Saginaw River and Unnamed Tributaries to Saginaw River	Fish and Water
040900010101-01	Includes: Black River, Darlington Drain, Lloyd Drain, Unnamed Tributaries to Black River, Unnamed Tributaries to Darlington Drain, and Unnamed Tributaries to Lloyd Drain	Fish and Water
040900010102-01	Includes: Black River, Grandy Drain, Pelton Drain, Thompson Drain, Unnamed Tributaries to Black River, and Unnamed Tributary to Grandy Drain	Fish and Water
040900010104-01	Includes: Black River, Nicol Drain, Smith Drain, Unnamed Tributaries to Nicol Drain, Unnamed Tributaries to Smith Drain, and Unnamed Tributary to Wilkins Drain	Fish and Water
040900010111-01	Includes: Elk Creek, Recor Drain, Meyers Drain, Alexander Drain, Methven Drain, Watertown State Drain, Lynch Drain, Smalldon Drain, Parks Drain, Mullen Drain, Colbough Drain.	Fish and Water
040900010112-01	Includes: Black River, Gordon Drain, McPherson Drain, Shrapnell Drain, Unnamed Tributaries to Black River, and Unnamed Tributaries to Shrapnell Drain	Fish and Water
040900010112-02	Includes: CARSONVILLE DRAIN	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040900010113-01	Includes: Arnot Creek, Black River, Freeman Drain, Kelly Creek, Kelly Drain, Papst Drain, Unnamed Tributaries to Black River, Unnamed Tributaries to Freeman Drain, Unnamed Tributaries to Kelly Creek, Unnamed Tributaries to Kelly Drain, Unnamed Tributaries	Fish and Water
040900010114-01	Includes: Arnot Creek, Black River, Mills Creek, Unnamed Tributaries to Arnot Creek, Unnamed Tributaries to Black River, and Unnamed Tributaries to Mills Creek	Fish and Water
040900010114-02	Includes: Black River and Unnamed Tributaries to Black River	Fish and Water
040900010211-01	Includes: Black River, Mason Drain, Plum Creek, Unnamed Tributaries to Black River, Unnamed Tributariest to Mason Drain, and Unnamed Tributaries to Plum Creek	Fish and Water
040900010211-02	Includes: Plum Creek, Pohly Drain, Engles Drain, and Unnamed Tributaries to Plum Creek	Fish and Water
040900010213-01	Includes: Black River, Glyshaw Drain, O Dette Drain, Unnamed Tributaries to Black River	Fish and Water
040900010214-01	Includes: Black River, Brandymore Drain, Howe Drain, Price Drain, Stocks Creek, Unnamed Tributaries to Black River, Unnamed Tributaries to Brandymore Drain, Unnamed Tributaries to Howe Drain, and Unnamed Tributariest to Stocks Creek	Fish and Water
040900030402-01	Includes: Clinton River and Unnamed Tributaries to Clinton River	Fish and Water
040900030402-03	Includes: Clinton River	Fish and Water
040900030402-04	Includes: Clinton River, Cranberry Marsh Drain, Faulman Drain, Hildebrandt Drain, Kukuk Drain, and Unnamed Tributaries to Clinton River	Fish and Water
040900040101-01	Includes: Bell Branch and Wolfrom Drain	Fish and Water
040900040102-01	Includes: Bell Branch and Tarabusi Creek	Fish and Water
040900040103-01	Includes: Smith Drain and Upper River Rouge	Fish and Water
040900040103-02	Includes: Seeley Drain	Fish and Water
040900040103-03	Includes: Minnow Pond Drain	Fish and Water
040900040201-01	Includes: Johnson Drain	Fish and Water
040900040201-02	Includes: Sump Drain	Fish and Water
040900040201-03	Includes: Johnson Drain	Fish and Water
040900040202-01	Includes: Deer Drain, Morgan Drain and South Branch Tonquish Creek	Fish and Water
040900040202-02	Includes: Travis Drain and Willow Creek	Fish and Water
040900040203-01	Includes: u/s Nankin Lake- Johnson Drain, Middle River Rouge and Walled Lake Branch	Fish and Water
040900040203-02	Includes: Thornton Creek and Walled Lake Branch	Fish and Water
040900040203-08	Includes: Bishop Creek	Fish and Water
040900040204-01	Includes: Middle River Rouge d/s Nankin Lake	Fish and Water
040900040301-01	Includes: Fellows Creek, Green Drain, Ingall Drain, North Branch Fellows Creek, South Branch Fellows Creek and Truesdell Drain	Fish and Water
040900040302-01	Includes: Bazley And Foster Drain, Goodell Drain, Lower River Rouge, McKinstry Drainand Mott Drain	Fish and Water
040900040302-02	Includes: Sines Drain	Fish and Water
040900040302-03	Includes: Lower River Rouge and Parks Drain	Fish and Water
040900040303-01	Includes: Bell Drain, Bingell Drain, Hunter Drain, Leng Drain, Lower River Rouge, Perrin Drain, Robinson Drain, Strong Drain and Wilbur Drain	Fish and Water
040900040401-01	Includes: Amy Drain and Sunken Bridge Drain	Fish and Water
040900040402-01	Includes: Franklin Branch	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
040900040403-01	Includes: Rouge, River	Fish and Water
040900040404-01	Includes: Rouge, River	Fish and Water
040900040404-02	Includes: Pebble Creek	Fish and Water
040900040405-01	Includes: Rouge, River	Fish and Water
040900040406-01	Includes: Ashcroft-Sherwood Drain, Rouge, River and Shaw Drain	Fish and Water
041000010201-01	Includes: PLUM CREEK	Fish and Water
041000020101-01	Includes: GOOSE CREEK	Fish and Water
041000020102-02	Includes: Briggs Lake Creek, Kedron Drain, Little Stony Lake Outlet, Mud Lake Outlet, Plum Brook Drain, River Raisin, Stony Lake Outlet, Unnamed Tributary to Mercury Lake, Unnamed Tributary to Mud Lake, Unnamed Tributary to Pickerel Lake, Unnamed Tributa	Fish and Water
041000020103-01	Includes: Bessey Lake Outlet, River Raisin, Sweezy Lake Outlet, and Unnamed Tributaries to River Raisin	Fish and Water
041000020103-02	Includes: River Raisin	Fish and Water
041000020104-01	Includes: Fay Lake Outlet, River Raisin, Unnamed Tributary to Fay Lake, and Unnamed Tributary to River Raisin	Fish and Water
041000020105-01	Includes: River Raisin	Fish and Water
041000020105-02	Includes: River Raisin and Unnamed Tributaries to River Raisin	Fish and Water
041000020106-01	Includes: Honey Lake Outlet, Iron Creek, Jordon Lake Outlet, Mud Lake Outlet, and Unnamed Tributary to Lower Lake	Fish and Water
041000020107-01	Includes: Evans Creek, Lamkin Drain, Taylor Creek, and Unnamed Tributaries to Evans Creek	Fish and Water
041000020108-01	Includes: River Raisin and Unnamed Tributaries to River Raisin	Fish and Water
041000020108-02	Includes: Dillingham Creek, River Raisin, and Unnamed Tributaries to River Raisin	Fish and Water
041000020201-01	Includes: Hazen Creek, Stoddard Drain, Unnamed Tributaries to Hazen Creek, and Unnamed Tributaries to Stoddard Drain	Fish and Water
041000020202-01	Includes: Cadmus Drain, Harrison Drain, Nash Drain, South Branch River Raisin, Stony Creek, Unnamed Tributary to Harrison Drain, and Unnamed Tributaries to South Branch River Raisin	Fish and Water
041000020203-01	Includes: Wolf Creek, Black Creek, Fisk Drain, and Unnamed Tribs	Fish and Water
041000020204-01	Includes: Squaw Creek, Wolf Creek, Unnamed Tributaries to Erin Lake, and Unnamed Tributaries to Squaw Creek	Fish and Water
041000020204-03	Includes: WOLF CREEK	Fish and Water
041000020205-01	Includes: Porter Drain and South Branch River Raisin	Fish and Water
041000020205-02	Includes: Savage Drain and South Branch River Raisin	Fish and Water
041000020206-01	Includes: South Branch River Raisin	Fish and Water
041000020302-02	Includes: Bear Creek	Fish and Water
041000020302-03	Includes: Camp Drain, J B Drain, Hudson Lake from the outlet upstream to include Bear Creek, Hennings Drain, Tucker Drain, and Unnamed Tribs	Fish and Water
041000020302-05	Includes: Baker and May Drain, Hoadley Drain, and Unnamed Tributaries to Baker and May Drain	Fish and Water
041000020302-06	Includes: Rice Lake Drain	Fish and Water
041000020305-01	Includes: BLACK CREEK	Fish and Water
041000020306-01	Includes: Big Meadow Drain, Grinnel Drain, Bixby Drain, and Unnamed Tribs	Fish and Water
041000020306-02	Includes: Unnamed Tributary to Big Meadow Drain	Fish and Water
041000020306-03	Includes: Big Meadow Drain	Fish and Water
041000020307-01	Includes: River Raisin upstream to Blissfield.	Fish and Water

AUID	Water Body Name	Basis of PCB Impairment
041000020307-02	Includes: Bay Drain, River Raisin upstream of Blissfield, Unnamed Tributaries to River Raisin, Floodwood Creek, Unnamed Tributaries to Floodwood Creek, and Unnamed Tributaries to River Raisin	Fish and Water
041000020308-01	Includes: River Raisin	Fish and Water
041000020308-02	Includes: Camp Drain, Unnamed Tributary to Camp Drain, and Unnamed Tributaries to River Raisin	Fish and Water
041000020309-01	Includes: Ash Drain, Fry Drain, Isley Drain, Little River Raisin, Miller Drain, Pope Drain, Swamp Raisin Creek, Unnamed Tributaries to Little River Raisin, Unnamed Tributaries to Swamp Raisin Creek, Westgate Drain, and Woodruff Brook	Fish and Water
041000020310-01	Includes: River Raisin	Fish and Water
041000020310-02	Includes: Dunlap Drain, Miller Drain, River Raisin, Roe Drain, Russell Drain, Stacy Drain, Unnamed Tributaries to Russell Drain, and Unnamed Tributary to Stacy Drain.	Fish and Water
041000020401-01	Includes: Columbia Lake Outlet, Joslin Lake Outlet, Saline River, Unnamed Tributaries to Columbia Lake, and Unnamed Tributaries to Saline River	Fish and Water
041000020402-01	Includes: Birkle Lake Outlet, Saline River, Unnamed Tributary to Birkle Lake, Unnamed Tributaries to Saline River, Unnamed Tributaries to Wood Outlet Drain, and Wood Outlet Drain	Fish and Water
041000020403-01	Includes: Koch Warner Drain, Pittsfield Number Five Drain, Saline River, and Unnamed Tributary to Saline River	Fish and Water
041000020404-01	Includes: MACON CREEK	Fish and Water
041000020405-01	Includes: Coats Drain, Dibble Drain, Schreeder Brook, South Branch Macon Creek, Springbrook Drain, Sutton Drain, Unnamed Tributary to Schreeder Brook, Unnamed Tributaries to South Branch Macon Creek, and Unnamed Tributary to Sutton Drain	Fish and Water
041000020406-01	Includes: Bear Swamp Creek, Center Creek, Cone Drain, Leet Weidner Drain, Nolan Engle Drain, Unnamed Tributary to Bear Swamp Creek, and Unnamed Tributaries to Center Creek	Fish and Water
041000020407-01	Includes: MACON CREEK	Fish and Water
041000020408-01	Includes: Macon Creek, Lappleman Drain, Middle Branch Macon Creek, Richardson Drain, and Unnamed Tribs	Fish and Water
041000020408-02	Includes: North Branch Macon Creek	Fish and Water
041000020409-01	Includes: Saline River	Fish and Water
041000020409-02	Includes: Bear Creek, Beaver Meadow Drain, Saline River, Sherman Wilson Drain, Unnamed Tributaries to Bear Creek, and Unnamed Tributaries to Bear Creek	Fish and Water
041000020409-03	Includes: Ella Lee Lake Outlet, Saline River, Unnamed Tributary to Ella Lee Lake, and Unnamed Tributary to Saline River	Fish and Water
041000020410-01	Includes: Barnaby Drain, Brost Drain, Brown Drain, Burdeau Drain, Karm Drain, Mason Run, Middle Branch Willow Run, Moore Drain, North Branch Willow Run, River Raisin, Sietz Drain, Unnamed Tributary to River Raisin, and Willow Run	Fish and Water
041000020410-02	Includes: River Raisin and Unnamed Tributary to River Raisin	Fish and Water
041000020410-03	Includes: River Raisin and Unnamed Tributary to River Raisin	Fish and Water
040500040407-03	From Morrice Road upstream to headwaters.	Fish and Water
040500030907-06	Located west of Allegan in Alley and Allegan Twps.	Fish
040500010503-02	SW of Vicksburg.	Fish
040900050309-01	Impoundment of Huron River in vicinity of Barton Hills (suburb of Ann Arbor). From dam u/s to Conrail RR bridge crossing.	Fish
040900050404-02	Ypsilanti, MI.	Fish
040900030108-03	Vicinity of Keego Harbor and West Bloomfield.	Fish

AUID	Water Body Name	Basis of PCB Impairment
040900030402-05	E. of Rochester.	Fish
040601040305-03	Vicinity of Benzonia and Beulah.	Fish
040500030702-01	NW of Martin (T2N, R11W, S15).	Fish
040900050403-02	Impoundment of the Huron River located between the cities of Ypsilanti and Romulus.	Fish
040601020905-03	SHERIDAN TWP., near city of Freemont (T12N, R14W, S2,3,4,9,10,11)	Fish
040301100107-02	SE of Neguinee and Ishpeming.	Fish
040601040302-03	Vicinity of Interlochen.	Fish
040500030507-04	Vicinity of Midland Park, Yorkville and MSU's Kellogg Biological Station.	Fish
040601020904-05	SE of Newaygo.	Fish
040601020101-02	Vicinity of Roscommon.	Fish
040802040403-05	NE of Richfield Center (Flint area).	Fish
040601020104-02	Vicinity of Houghton Lake, Houghton Heights and Prudenville.	Fish
040802040408-03	Flint River confluence just u/s of Western Road.	Fish
040900050106-04	An impoundment on the main stem of the Huron River. Its u/s boundary is Dawson Rd. and d/s is the Kent Lake spillway at I-96.	Fish
040500012603-02	Vicinity of Berrien Springs.	Fish
040900030105-02	Orion Twp. at Lake Orion.	Fish
040802030108-08	NW of Fenton.	Fish
040802030109-05	2 miles SW of Linden (Argentine Twp.).	Fish
040900030103-04	NW of Pontiac at Drayton Plains.	Fish
040500012405-05	Vicinity of Paw Paw.	Fish
040500060311-03	S. of Rt. 96 due S. of Saranac.	Fish
040500030509-02	Located in the vicinity of Galesburg (36th Street) and Comstock.	Fish
040900030108-08	U/s of Terry Lake in the vicinity of Pontiac and part of the Upper Silver Lake drainage into the headwaters of the Clinton River.	Fish
040900050101-04	NW of Pontiac in the headwaters of the Huron River.	Fish
040500060507-07	Vicinity of E. Grand Rapids.	Fish
040400010202-01	Includes: East Branch Galien River and Judy Lake Drain	Fish
040400010203-01	Includes: Blue Jay Creek and Galien River	Fish
040500020208-01	Includes: Merriman Lake Outlet, Bangor Impoundment, School Section Lake Outlet, South Branch Black River, and Unnamed Tributaries to South Branch Black River	Fish
040500020209-01	Includes: South Branch Black River and Unnamed Tributaries to South Branch Black River	Fish
040500020302-02	Includes: BLENDON AND OLIVE DRAIN (PIGEON RIVER HEADWATERS)	Fish
040601011010-01	Includes: BLACK CREEK	Fish
040601011011-01	Includes: BLACK CREEK	Fish
040601050203-01	Includes: Cramer Creek, Kuznick Creek, Licks Creek, North Branch Boyne River and Schoolhouse Creek	Fish
040601050205-01	Includes: Boyne River, Moyer Creek and South Branch Boyne River	Fish
040801010411-01	Includes: Saverine Creek and Unnamed Tributaries to Saverine Creek	Fish
040801010412-01	Includes: Rifle River and Unnamed Tributaries to Rifle River	Fish

AUID	Water Body Name	Basis of PCB Impairment
040900010302-01	Includes: Apply Drain, Campbell Drain, Cowhy Drain, Green Drain, Johnson Drain, Moore Creek, Parker Drain, Riley-Wales Drain, South Branch Pine River, Unnamed Tributaries to Apply Drain, Unnamed Tributaries to Campbell Drain, Unnamed Tributaries to Johns	Fish
040900010303-01	Includes: Smiths Creek from Pine River confluence upstream to Palms Road	Fish
040900010304-01	Includes: Big Creek, Holland Drain, London Drain, Nelson Drain, Pine River, Unnamed Tributaries to Big Creek, Unnamed Tributaries to Holland Drain, Unnamed Tributaries to Nelson Drain, Unnamed Tributaries to Pine River, and Wolvin Drain	Fish
040900010305-01	Includes: Big Hand Drain, Dawson Drain, Mackley Drain, Rattle Run, Sheldon Drain, Tinsman Drain, Unnamed Tributary to Dawson Creek, Unnamed Tributary to Mackley Drain, and Unnamed Tributaries to Rattle Run	Fish
040900010306-01	Includes: Angel Creek, Barringer Drain, Bowman Drain, Brandywine Creek, Jordan Creek, Moak Drain, Pine River, Wolf Drain, Unnamed Tributaries to Jordan Creek, Unnamed Tributaries to Moak Drain, and Unnamed Tributaries to Pine River	Fish
040802010408-03	NW of Midland at Sanford.	Fish
040900030109-02	Stony Creek Metropolitan Park, vicinity of Romeo.	Fish
040900030108-07	NW of Pontiac. Located between Osmun and Harris Lakes.	Fish
040802030104-02	Vicinity of Howell.	Fish
040802040306-03	Upstream of Rt. 475. Vicinity of Flint.	Fish
040500010403-03	Vicinity of Union City u/s of Dunk Rd. dam.	Fish
040900040203-05	Vicinity of Novi.	Fish
040900050301-02	Vicinity of Whitmore Lake.	Fish
040900050111-03	N. of Brighton.	Fish
040201020102-01	Includes: Tenderfoot Creek	Water
040201020103-01	Includes: Cisco Branch Ontonagon River, Grosbeck Creek and Langford Creek	Water
040201020104-01	Includes: Blair Creek and Twomile Creek	Water
040201020105-01	Includes: Iddings Creek, Tenmile Creek, Toles Creek and Weir Creek	Water
040201020106-01	Includes: Caddis Creek, Sisson-Lilley Creek, Tenmile Creek and Wanagan Creek	Water
040201020107-01	Includes: Cisco Branch Ontonagon River, Custer Creek, Ratford Creek and Snuffbox Creek	Water
040201020108-01	Includes: Bluff Creek, Matheson Creek and Paulding Creek	Water
040201020108-02	Includes: Bluff Creek and Roselawn Creek	Water
040201020109-01	Includes: Choate Creek, Redlight Creek, Scott and Howe Creek and Sucker Creek	Water
040201020109-02	Includes: Sucker Creek	Water
040201020110-01	Includes: Kostlenick Creek and South Branch Ontonagon River	Water
040201020111-01	Includes: Cedar Creek, Farmer Creek, Junco Creek, Maple Leaf Creek, Mulligan Creek and South Branch Ontonagon River	Water
040201020201-01	Includes: Duck Creek and Forty Five Creek	Water
040201020201-02	Includes: Duck Creek	Water
040201020202-01	Includes: Cowslip Creek, Henderson Creek, Marathon Creek, Middle Branch Ontonagon River, Snap Jack Creek, Teds Creek, Wolf Creek and Zigzag Creek	Water
040201020203-01	Includes: Cedar Creek, Imp Creek, Tamarack River and Taylor Creek	Water
040201020204-01	Includes: Bonifas Creek, Marion Creek, Middle Branch Ontonagon River, Morrison Creek and Sargents Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040201020204-04	Includes: McGinty Creek	Water
040201020205-01	Includes: Aho Creek, Interior Creek and Middle Branch Ontonagon River	Water
040201020205-03	Includes: Deadman Creek	Water
040201020206-01	Includes: Dorrie Creek, Dover Creek, Emanuel Creek, Mannis Creek, Payseor Creek, Rolston Creek and Trout Creek	Water
040201020207-01	Includes: Meto Creek, Middle Branch Ontonagon River, Nevala Creek, Payne Creek and Tom Creek	Water
040201020208-01	Includes: Baltimore River, Pietila Creek and Pine Creek	Water
040201020209-01	Includes: Clear Creek, House Creek and Mile and One-half Creek	Water
040201020210-01	Includes: Baltimore River, Clear Creek and Hide Creek	Water
040201020211-01	Includes: Champagne Creek, Darling Creek, Lane Creek, Longtime Creek, Middle Branch Ontonagon River, Slough Creek and Spring Creek	Water
040201020301-02	Includes: East Branch Ontonagon River, Glitter Creek, Johns Creek and Preston Creek	Water
040201020302-01	Includes: Dunn Creek, Passmore Creek and Stony Creek	Water
040201020303-03	Includes: Includes: Jumbo River, Shane Creek, Tepee Creek, Walton Creek, Jake Creek, West Branch Jumbo River and Wildman Creek	Water
040201020304-01	Includes: East Branch Ontonagon River	Water
040201020304-02	Includes: East Branch Ontonagon River, Lake Thirteen Creek and Smith Creek	Water
040201020304-03	Includes: Spargo Creek	Water
040201020305-02	Includes: Beaver Creek	Water
040201020306-01	Includes: Adrian Creek, Buritts Creek, Debutant Creek, Dogwood Creek, East Branch Ontonagon River, Kits Creek, Onion Creek and Skoglund Creek	Water
040201020307-01	Includes: Bob Lake Creek	Water
040201020307-02	Includes: Hubbell Creek, Jug Creek, Larochele Creek, Newholm Creek and Pori Creek	Water
040201020307-03	Includes: Leveque Creek	Water
040201020308-02	Includes: Adventure Creek, Defoe Creek and Porterfield Creek	Water
040201020308-04	Includes: Bond Creek, East Branch Ontonagon River and Grade Creek	Water
040201020308-05	Includes: Adventure Creek	Water
040201020309-01	Includes: Deer Lick Creek, East Branch Ontonagon River and Tank Creek	Water
040201020309-02	Includes: East Branch Ontonagon River	Water
040201020401-01	Includes: Nelson Creek	Water
040201020401-02	Includes: Marshall Creek	Water
040201020401-03	Includes: Gypo Creek, Santa Fe Creek, Slate River and Sparkling Creek	Water
040201020401-04	Includes: Banner Creek and Pelton River	Water
040201020402-01	Includes: Speckled Brook	Water
040201020402-02	Includes: Trout Brook	Water
040201020403-01	Includes: Merriweather Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040201020403-02	Includes: Merriweather Creek	Water
040201020403-03	Includes: Unnamed Tributary to Merriweather Creek	Water
040201020404-01	Includes: Bingham Creek, Hendrick Creek, Knute Creek and Montgomery Creek	Water
040201020405-01	Includes: Cascade Creek and Sandhill Creek	Water
040201020406-01	Includes: Bebo Creek, Brown Creek, Livingston Creek, Match Creek, Mill Creek and Shoemaker Creek	Water
040201020407-01	Includes: Gleason Creek, Russell Creek, Stindt Creek, Trestle Creek, West Branch Ontonagon River, Whisky Hollow Creek and Woodpecker Creek	Water
040201020408-01	Includes: Cushman Creek, Erickson Creek, Johnson Creek, Schaat Creek and West Branch Ontonagon River	Water
040201020409-01	Includes: West Branch Ontonagon River, Austin Creek, East Branch Mill Creek, Gates Creek, Irish Creek, Mill Creek, Ontonagon River, Patty Creek, Plover Creek, Rockland Creek, Sandstone Creek and Sucker Creek	Water
040201020409-02	Includes: Unnamed Tributary to Ontonagon River	Water
040202020101-01	Includes: Kings Creek and Tahquamenon River	Water
040202020101-02	Includes: Tahquamenon River	Water
040202020101-03	Includes: Syphon Creek	Water
040202020102-01	Includes: Laketon Slough and Tahquamenon River	Water
040202020102-02	Includes: East Creek and Red Creek	Water
040202020103-01	Includes: Tahquamenon River	Water
040202020103-02	Includes: Unnamed Tributary to East Creek	Water
040202020104-01	Includes: Teaspoon Creek	Water
040202020105-01	Includes: Carlson Creek and Petes Creek	Water
040202020105-02	Includes: McGraw Creek	Water
040202020105-04	Includes: East Lake Creek and Teaspoon Creek	Water
040202020106-02	Includes: Silver Creek and Tahquamenon River	Water
040202020107-01	Includes: Sixteen Creek, Tahquamenon River and Thirtynine Creek	Water
040202020201-01	Includes: Third Creek	Water
040202020202-01	Includes: First Creek	Water
040202020203-01	Includes: East Branch Sage River	Water
040202020204-01	Includes: Sage River	Water
040202020301-01	Includes: Quinn Creek	Water
040202020301-02	Includes: Hendrie River and Naugle Creek	Water
040202020302-01	Includes: Anguilm Creek and South Branch Hendrie River	Water
040202020303-01	Includes: West Branch Hendrie River	Water
040202020304-01	Includes: Unnamed Tributaries to Hendrie River	Water
040202020304-02	Includes: Hendrie River	Water
040202020305-01	Includes: Hendrie River	Water
040202020401-03	Includes: Creek Number Eightand East Branch Tahquamenon River	Water

AUID	Water Body Name	Basis of PCB Impairment
040202020402-01	Includes: East Branch Tahquamenon River and Grants Creek	Water
040202020403-01	Includes: Creek Number Fourteen, East Branch Tahquamenon River and Riley Creek	Water
040202020404-01	Includes: Big Beaver Creek, East Branch Tahquamenon River, Little Beaver Creek and Riley Creek	Water
040202020501-01	Includes: Auger Creek	Water
040202020502-01	Includes: Gimlet Creek	Water
040202020503-01	Includes: Atwood Creek and Murphy Creek	Water
040202020503-02	Includes: North Branch Murphy Creek	Water
040202020504-01	Includes: Hiawatha Creek and Tahquamenon River	Water
040202020505-01	Includes: Baird Creek, Freeman Creek, Penny Creek, Popp's Creek and Tahquamenon River	Water
040202020506-01	Includes: Callam Creek, Linton Creek, Middle Branch Linton Creek, North Branch Linton Creek, Rose Creek, South Branch Linton Creek and Tahquamenon River	Water
040202020507-01	Includes: Anchar Creek and Bowers Creek	Water
040202020507-02	Includes: Tahquamenon River	Water
040202020508-02	Includes: Cheney Creek	Water
040301060101-01	Includes: Mallard Creek, Mitigwaki Creek, North Branch Paint River, Paint Creek, Thirtythree Creek, Unnamed Tributaries to Mitigwaki Lake, and Unnamed Tributaries to Paint Lake	Water
040301060102-01	Includes: Holmes Creek, North Branch Paint River, Winslow Creek, and Unnamed Tributary to Winslow Lake	Water
040301060103-01	Includes: Cook's Run	Water
040301060104-02	Includes: South Branch Paint River and Unnamed Tributaries to South Branch Paint River	Water
040301060105-01	Includes: Lode Creek, McAllister Creek, McRae Creek, South Branch Paint River, and Unnamed Tributaries to South Branch Paint River	Water
040301060106-01	Includes: Golden Creek	Water
040301060106-02	Includes: Bush Creek	Water
040301060106-03	Includes: North Branch Paint River and Stump Creek	Water
040301060401-01	Includes: Silver Creek	Water
040301060401-02	Includes: Edna Creek, McColman Creek, Paint River, and Unnamed Tributary to Edna Creek	Water
040301060402-01	Includes: East Branch Hemlock River, Old Joe Creek, West Branch Hemlock River	Water
040301060403-01	Includes: Hemlock River, Manila Creek, and Unnamed Tributaries to Hemlock River	Water
040301060403-02	Includes: Little Hemlock River, Nelson Creek, and Youngers Creek	Water
040301060403-03	Includes: Railroad Creek	Water
040301060404-01	Includes: Barnetts Creek, Paint River, Parks Creek, and Unnamed Tributaries to Paint River	Water
040301060404-02	Includes: Morrison Creek	Water
040301060405-01	Includes: Cedar Creek, Chicagon Slough, Gravel Pit Creek, Olson Creek, Unnamed Tributaries to Emily Lake, Unnamed Tributaries to Wagner Lake, and Wagner Creek	Water
040301060406-02	Includes: Crystal Spring Creek, Fire Lake Creek, Paint River, Peterson Creek, Unnamed Tributary to Paint River, and Unnamed Tributary to Peterson Creek	Water
040301060407-01	Includes: Mud Lakes Outlet, Paint River, Saint Paul Creek, Swan Lake Outlet, and Unnamed Tributary to Swan Lake	Water

AUID	Water Body Name	Basis of PCB Impairment
040301060407-02	Includes: Paint River	Water
040301060407-04	Includes: Briar Hill Creek	Water
040301060408-01	Includes: Little Tobin Creek, Paint River, Tim Bowers Creek, and Unnamed Tributaries to Paint River	Water
040301060408-03	Includes: Paint River	Water
040301060408-04	Includes: Dunn Creek	Water
040301080301-01	Includes: North Branch Sturgeon River	Water
040301080302-01	Includes: Gestner Branch and West Branch Sturgeon River	Water
040301080303-01	Includes: Schultz Creek, Tom Kings Creek and West Branch Sturgeon River	Water
040301080304-01	Includes: East Branch Sturgeon River	Water
040301080305-01	Includes: East Branch Sturgeon River	Water
040301080305-02	Includes: Sixmile Creek	Water
040301080306-01	Includes: East Branch Sturgeon River	Water
040301080306-02	Includes: East Branch Skunk Creek and Skunk Creek	Water
040301080307-01	Includes: East Branch Sturgeon River	Water
040301080308-01	Includes: Jansen Creek, Menominee River and Mitchell Creek	Water
040301080309-01	Includes: Anderson Creek, East Branch Sturgeon River, Hancock Creek, Pocans Creek, Quarry Creek and Schultz Creek	Water
040301080401-01	Includes: Steel Creek	Water
040301080401-03	Includes: Pine Creek	Water
040301080402-01	Includes: Harding Creek, Hosking Creek and Pine Creek	Water
040301080402-02	Includes: Seiberts Creek	Water
040301080403-01	Includes: Sturgeon River	Water
040301080403-02	Includes: Breen Creek	Water
040301080404-01	Includes: Sturgeon River	Water
040301080404-02	Includes: Cassidy Creek	Water
040301080405-01	Includes: Beaver Creek, Lost Creek and Sturgeon River	Water
040301080406-01	Includes: Fern Creek	Water
040301080407-03	Includes: Cheney Creek	Water
040301080407-04	Includes: Earle Brook, Fitzgerald Creek and Turners Creek	Water
040301080801-01	Includes: Holmes Creek	Water
040301080801-02	Includes: Poterfield Creek and Unnamed Tributary to Poterfield Creek	Water
040301080801-03	Includes: Poterfield Creek	Water
040301080802-01	Includes: Camp Two Creek, Laurin Creek, Little Cedar River and Schetter Creek	Water
040301080803-01	Includes: Boyle Creek and Hays Creek	Water
040301080804-01	Includes: Little Cedar River, Ross Creek and Snow Creek	Water
040301080901-01	Includes: Little Shakey Creek, Shakey River and Swanson Creek	Water
040301090201-01	Includes: Tenmile Creek	Water
040301090202-01	Includes: Camp Creek and Ford River	Water

AUID	Water Body Name	Basis of PCB Impairment
040301090202-02	Includes: Twentyfour Mile Creek and West Branch Twentyfour Mile Creek	Water
040301090203-01	Includes: Tenmile Creek	Water
040301090204-01	Includes: Ford River	Water
040301090205-01	Includes: Fenlon Creek, Fivemile Creek and Ford River	Water
040301100101-01	Includes: Brown Creek, Halfway Creek, Kipple Creek, Koops Creek, Middle Branch Escanaba River and Second River	Water
040301100102-01	Includes: Black River and Bruce Creek	Water
040301100103-01	Includes: Black River	Water
040301100104-01	Includes: Rocky Creek and West Branch Middle Branch Escanaba River	Water
040301100105-01	Includes: Bell Creek and Middle Branch Escanaba River	Water
040301100106-01	Includes: Ely Creek, Green Creek and Schweitzer Creek	Water
040301100107-01	Includes: Goose Lake Outlet	Water
040301100107-03	Includes: Goose Lake Inlet	Water
040301100108-01	Includes: East Branch Escanaba River and Fifteen Creek	Water
040301100108-02	Includes: Warner Creek downstream of M35 North of Palmer	Water
040301100108-03	Includes: Warner Creek upstream of M35 North of Palmer	Water
040301100109-01	Includes: Green Creek	Water
040301100110-01	Includes: East Branch Escanaba River, Halfway Creek, O'Neal Creek and Uncle Tom Creek	Water
040301100111-01	Includes: Bear Creek, Flopper Creek and Middle Branch Escanaba River	Water
040301100201-01	Includes: Flat Rock Creek and Wild West Creek	Water
040301100202-01	Includes: McGregor Creek, Schwartz Creek and West Branch Escanaba River	Water
040301100203-01	Includes: Big Brook, Camp Eleven Creek and Little Brook	Water
040301100204-01	Includes: Bass Creek, Bryan Creek, Clear Creek and Poplar Creek	Water
040301100205-01	Includes: Cady Creek and West Branch Escanaba River	Water
040301100206-01	Includes: Chandler Brook, Gleason Creek, Miller Creek and West Branch Escanaba River	Water
040301100301-01	Includes: Bobs Creek, Escanaba River and Wilson Creek	Water
040301100302-01	Includes: Mud Creek and Sawmill Creek	Water
040301100303-01	Includes: Chynes Creek, Lindsey Creek, Little West Branch Escanaba River and Lone Pine Creek	Water
040301100304-01	Includes: Escanaba River and Swimming Hole Creek	Water
040301100305-01	Includes: Squaw Creek and Summer Meadow Creek	Water
040301100306-01	Includes: Hunters Brook	Water
040301100307-01	Includes: Escanaba River, Indian Creek and Mosquito Creek	Water
040301100308-01	Includes: Bichler Creek, Escanaba River and Silver Creek	Water
040301100308-02	Includes: Escanaba River	Water
040301100308-03	Includes: Escanaba River and Reno Creek	Water
040301120201-01	Includes: West Branch Sturgeon River	Water
040301120202-01	Includes: Camp R Creek and Sturgeon River	Water
040301120203-01	Includes: Sturgeon River	Water

AUID	Water Body Name	Basis of PCB Impairment
040301120204-01	Includes: Eighteenmile Creek, Johnson Creek and Mink Creek	Water
040301120205-01	Includes: Black Creek, Little Black Creek and Sturgeon River	Water
040301120206-01	Includes: Mormon Creek, Moses Creek and Sturgeon River	Water
040301120207-01	Includes: Bull Run and Sturgeon River	Water
040500020302-03	Includes: Pigeon River and Sawyer Creek	Water
040500030103-01	Includes: North Branch Kalamazoo River	Water
040500030104-01	Includes: North Branch Kalamazoo River	Water
040500030201-01	Includes: South Branch Kalamazoo River	Water
040500030202-01	Includes: South Branch Kalamazoo River	Water
040500030202-02	Includes: Unnamed Tributaries to Cobb Lake and Hastings Lake and Unnamed Tributary to South Branch Kalamazoo River	Water
040500030203-02	Includes: South Branch Kalamazoo River	Water
040500030204-04	Includes: South Branch Kalamazoo River	Water
040500030205-01	Includes: Unnamed Tributaries to South Branch Kalamazoo River	Water
040500030206-01	Includes: South Branch Kalamazoo River	Water
040500030206-02	Includes: South Branch Kalamazoo River	Water
040500030406-01	Includes: Kalamazoo River	Water
040500030406-02	Includes: Kalamazoo River	Water
040500030407-01	Includes: Kalamazoo River	Water
040500030407-02	Includes: Kalamazoo River	Water
040601010701-01	Includes: James Creek and South Branch White River	Water
040601010701-02	Includes: Mullen Creek	Water
040601010702-01	Includes: Fivemile Creek	Water
040601010703-01	Includes: South Branch White River	Water
040601010703-03	Includes: Flinton Creek	Water
040601010704-01	Includes: Rattlesnake Creek and South Branch White River	Water
040601010704-02	Includes: BLACK (DELONG) CREEK	Water
040601010704-03	Includes: BLACK (DELONG) CREEK	Water
040601010704-05	Includes: Robinson Creek	Water
040601010705-01	Includes: South Branch White River	Water
040601010705-02	Includes: Mena Creek	Water
040601010705-03	Includes: East Branch Heald Creek, Martin Creek and West Branch Heald Creek	Water
040601010706-01	Includes: South Branch White River	Water
040601010706-03	Includes: Brayton Drain	Water
040601010707-02	Includes: Cushman Creek	Water
040601010707-03	Includes: South Branch White River	Water
040601010707-04	Includes: Skeel Creek	Water
040601010801-02	Includes: North Branch White River	Water

AUID	Water Body Name	Basis of PCB Impairment
040601010802-01	Includes: Robinson Creek	Water
040601010803-02	Includes: Swinton Creek and Osborn Creek	Water
040601010803-03	Includes: North Branch White River	Water
040601010804-01	Includes: BEAR (NEWMAN) CREEK	Water
040601010804-03	Includes: Knutson Creek	Water
040601010804-04	Includes: North Branch White River	Water
040601010901-04	Includes: Cleveland Creek and White River	Water
040601010901-05	Includes: Sand Creek	Water
040601010902-02	Includes: Carlton Creek and Unnamed Tributaries to White River	Water
040601010904-05	Includes: Silver Creek	Water
040601010904-06	Includes: Carleton Creek, Carlton Creek and White River	Water
040601020101-01	Includes: Big Creek	Water
040601020102-01	Includes: Denton Creek and North Branch Denton Creek	Water
040601020103-01	Includes: Backus Creek and Cut, The	Water
040601020104-01	Includes: Denton Creek and Spring Brook	Water
040601020201-01	Includes: Unnamed Tributary to Dead Stream	Water
040601020202-01	Includes: Unnamed Tributary near Wilson Road	Water
040601020203-01	Includes: Unnamed Tributary near Seven Mile Road	Water
040601020203-02	Includes: Haymarsh Creek	Water
040601020204-01	Includes: Unnamed Tributaries near Loon Lake and Rhoby Road	Water
040601020204-02	Includes: West Branch Muskegon River	Water
040601020205-01	Includes: Unnamed Tributary near Gray Road	Water
040601020205-02	Includes: West Branch Muskegon River	Water
040601020206-01	Includes: Unnamed Tributaries near Eight Mile Road and Nine Mile Road	Water
040601020206-02	Includes: Butterfield Creek	Water
040601020207-01	Includes: Muskegon River	Water
040601020207-02	Includes: Muskegon River	Water
040601020208-01	Includes: Unnamed Tributary near Kelly Road	Water
040601020208-02	Includes: Butterfield Creek	Water
040601020209-01	Includes: Unnamed Tributary to Muskegon River	Water
040601020209-02	Includes: Muskegon River	Water
040601020301-01	Includes: Mitchell Creek	Water
040601020302-03	Includes: Unnamed Tributary between Lake Mitchell and Lake Cadillac	Water
040601020303-01	Includes: Clam River	Water
040601020304-01	Includes: Clam River	Water
040601020305-01	Includes: Unnamed Tributary to Twin Lake	Water
040601020305-05	Includes: Mosquito Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601020306-01	Includes: Clam River, Marks Creek, Stick Creek and Taylor Creek	Water
040601020307-01	Includes: Clam River	Water
040601020308-01	Includes: Middle Branch Creek and Ryan Creek	Water
040601020308-02	Includes: North Branch Creek	Water
040601020309-01	Includes: West Branch Clam River	Water
040601020309-02	Includes: Middle Branch Creek and West Branch Clam River	Water
040601020310-01	Includes: Unnamed Tributary near Mulder Road	Water
040601020310-02	Includes: Clam River	Water
040601020310-03	Includes: Clam River	Water
040601020401-01	Includes: East Branch Wolf Creek, Pup Creek and Wolf Creek	Water
040601020402-01	Includes: Muskegon River	Water
040601020402-02	Includes: Muskegon River	Water
040601020402-03	Includes: Bear Creek and Muskegon River	Water
040601020403-01	Includes: South Branch Town Line Creek	Water
040601020404-01	Includes: Town Line Creek and Townline Creek	Water
040601020405-01	Includes: Prestie Creek and Unnamed Tributary near Arnold Lake Road	Water
040601020405-02	Includes: Floodwood Creek	Water
040601020406-01	Includes: Unnamed Tributaries to Cranberry Lake	Water
040601020406-02	Includes: Cranberry Creek and Muskegon River	Water
040601020406-03	Includes: Muskegon River	Water
040601020501-01	Includes: Unnamed Tributary to Green Creek	Water
040601020501-02	Includes: Green Creek	Water
040601020502-01	Includes: Appleby Creek, Beebe Creek, Crocker Creek, Franz Creek, Hicks Creek and Middle Branch River	Water
040601020503-01	Includes: Unnamed Tributaries near 70th Avenue	Water
040601020503-02	Includes: Middle Branch River and West Branch Middle Branch River	Water
040601020503-03	Includes: Unnamed Tributary to Middle Branch River	Water
040601020504-01	Includes: Unnamed Tributary near Twin Lakes Avenue	Water
040601020504-02	Includes: Dishwash Creek, Giss-I-Was Creek, Halford Creek, Little Norway Creek, Muskegon River and Whisky Creek	Water
040601020505-01	Includes: Lost Lake Outlet	Water
040601020505-02	Includes: Doc And Tom Creek, Hemlock Creek and Shingle Creek	Water
040601020506-01	Includes: Grindstone Creek and Whetstone Creek	Water
040601020506-02	Includes: Kinney Creek, Muskegon River and Norway Creek	Water
040601020506-03	Includes: Muskegon River	Water
040601020507-01	Includes: Chippewa Creek	Water
040601020507-02	Includes: Chippewa Creek, Muskegon River, Posted Creek and Sandy Run	Water
040601020507-05	Includes: Unnamed Tributary to Muskegon River	Water
040601020601-01	Includes: Blanchard Lake Outlet and Unnamed Tributary to Lake Miramichi	Water

AUID	Water Body Name	Basis of PCB Impairment
040601020601-02	Includes: Bull Kill Creek and Sherlock Creek	Water
040601020602-01	Includes: East Branch Hersey Creek and Olson Creek	Water
040601020603-01	Includes: Unnamed Tributary near Nine Mile Road	Water
040601020603-02	Includes: Indian Creek and Lincoln Creek	Water
040601020604-01	Includes: Burt Creek, Hersey Creek, Hersey River and Kissinger Creek	Water
040601020605-01	Includes: Mud Creek and Muskegon River	Water
040601020605-02	Includes: Twin Creek	Water
040601020606-01	Includes: Hersey River, Hewitt Creek, Jewitt Creek, Johnson Creek, Knuth Creek and Lawrence Creek	Water
040601020606-02	Includes: Shaw Creek	Water
040601020607-01	Includes: Bull Hill Creek, Cat Creek, Muskegon River and Polick Creek	Water
040601020607-02	Includes: Muskegon River	Water
040601020701-01	Includes: Brown Creek and Unnamed Tributaries near One Mile Road (Osceola County) and 130th Ave (Mecosta County)	Water
040601020701-02	Includes: Blodgett Creek, Buckhorn Creek and Muskegon River	Water
040601020702-01	Includes: Unnamed Tributary near 195th Avenue	Water
040601020702-02	Includes: Ford Creek, Muskegon River and Paris Creek	Water
040601020702-03	Includes: Unnamed Tributary near 18 Mile Road	Water
040601020702-04	Includes: Dalziel Creek	Water
040601020702-05	Includes: Dalziel Creek	Water
040601020703-01	Includes: Haymarsh Creek	Water
040601020703-02	Includes: Ryan Creek	Water
040601020704-01	Includes: Cold Spring Creek and Muskegon River	Water
040601020704-02	Includes: Byers Creek, Higginson Creek, Muskegon River and Winters Creek	Water
040601020704-05	Includes: Unnamed Tributary to Muskegon River	Water
040601020704-06	Includes: Mitchell Creek	Water
040601020705-01	Includes: Bennett Creek, Betts Creek, Hodgers Creek, Ladner Creek, Macks Creek and Muskegon River	Water
040601020705-02	Includes: Unnamed Tributary to Muskegon River	Water
040601020706-01	Includes: Laverne Creek, Muskegon River, Rosy Run, South Mitchell Creek and Thumser Creek	Water
040601020801-01	Includes: Unnamed Tributary near M-20	Water
040601020801-04	Includes: Gilbert Creek and West Branch Little Muskegon River	Water
040601020802-01	Includes: Dye Creek, East Branch Little Muskegon River and East Schrader Creek	Water
040601020803-01	Includes: Cedar Creek	Water
040601020803-02	Includes: Shinglebolt Creek	Water
040601020803-03	Includes: Little Muskegon River	Water
040601020803-04	Includes: BROCKWAY CREEK	Water
040601020803-05	Includes: Sylvester Creek	Water
040601020804-01	Includes: Tamarack Creek	Water
040601020805-01	Includes: Tamarack Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601020805-02	Includes: WEATHERBY DRAIN	Water
040601020806-01	Includes: Unnamed Tributary near West County Line Road	Water
040601020806-04	Includes: Unnamed Tributaries to Rice Creek and Unnamed Tributaries to Little Whitefish Lake and Whitefish Lake	Water
040601020807-01	Includes: Big Creek	Water
040601020808-01	Includes: Unnamed Tributary near Six Mile Road	Water
040601020808-02	Includes: Little Muskegon River	Water
040601020808-03	Includes: Quigley Creek	Water
040601020808-04	Includes: Little Muskegon River	Water
040601020809-01	Includes: Rice Creek and Tamarack Creek	Water
040601020810-01	Includes: Unnamed Tributaries to Little Muskegon River	Water
040601020810-02	Includes: Little Muskegon River	Water
040601020810-03	Includes: Handy Creek	Water
040601020810-04	Includes: Unnamed Tributaries to Little Muskegon River	Water
040601020901-01	Includes: Muskegon River excluding 1 mile stretch from Hardy Dam downstream	Water
040601020902-01	Includes: Unnamed Tributary to Twinwood Lake	Water
040601020902-02	Includes: Bigelow Creek and Cold Creek	Water
040601020903-03	Includes: Penoyer Creek	Water
040601020904-02	Includes: Brooks Creek	Water
040601020904-06	Includes: WHEELER DRAIN	Water
040601020905-01	Includes: Unnamed Tributaries to Fourth Lake, Fremont Lake, Second Lake, and Third Lake	Water
040601020905-02	Includes: Unnamed Tributary to Fremont Lake	Water
040601020905-04	Includes: Brooks Creek and Cow Creek	Water
040601020905-06	Includes: Daisy Creek and Spring Creek	Water
040601020905-07	Includes: Lorden Lake Outlet and Unnamed Tributary to Lorden Lake	Water
040601020905-08	Includes: UNNAMED TRIBUTARY (TO FREMONT LAKE, SE	Water
040601020905-09	Includes: Graham Creek	Water
040601020905-10	Includes: KEMPF SCHOOL CREEK	Water
040601020905-11	Includes: Butler Creek and Williams Creek	Water
040601020906-02	Includes: Sand Creek	Water
040601020906-03	Includes: Minnie Creek	Water
040601020906-04	Includes: Minnie Creek	Water
040601021001-03	Includes: Cedar Creek, Little Cedar Creek and Sweeter Creek	Water
040601021002-05	Includes: Mosquito Creek	Water
040601021003-07	Includes: Little Bear Creek	Water
040601021003-08	Includes: Bear Creek	Water
040601021004-05	Includes: Green Creek	Water
040601021004-06	Includes: Fourmile Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601021004-07	Includes: Ryerson Creek	Water
040601030101-01	Includes: Frenchman Creek and Manistee River	Water
040601030101-02	Includes: Frenchman Creek	Water
040601030102-01	Includes: Goose Creek	Water
040601030103-01	Includes: Manistee River	Water
040601030103-02	Includes: Manistee River	Water
040601030104-01	Includes: Manistee River	Water
040601030104-02	Includes: Unnamed Tributary to Manistee River	Water
040601030104-03	Includes: Portage Creek	Water
040601030105-01	Includes: Manistee River	Water
040601030105-02	Includes: Black Creek	Water
040601030105-03	Includes: Black Creek	Water
040601030106-01	Includes: Pickerel Lake Outlet	Water
040601030106-02	Includes: North Branch Manistee River	Water
040601030107-01	Includes: Big Cannon Creek	Water
040601030107-02	Includes: Big Cannon Creek	Water
040601030107-03	Includes: Big Cannon Creek	Water
040601030108-01	Includes: Collar Creek, Morrison Creek, North Branch Manistee River and Sand Creek	Water
040601030109-01	Includes: Manistee River	Water
040601030109-02	Includes: Unnamed Tributaries to Manistee River	Water
040601030109-03	Includes: Little Devil Creek	Water
040601030109-04	Includes: Big Devil Creek	Water
040601030201-01	Includes: Little Cannon Creek and Silver Creek	Water
040601030202-01	Includes: Manistee River	Water
040601030202-02	Includes: Maple Creek	Water
040601030202-03	Includes: Pierson Creek	Water
040601030202-04	Includes: Pierson Creek and Willow Creek	Water
040601030203-01	Includes: Ham Creek	Water
040601030204-01	Includes: Hopkins Creek	Water
040601030205-01	Includes: Manistee River	Water
040601030205-02	Includes: Bourne Creek, Filer Creek, Hopkins Creek and Spring Creek	Water
040601030206-01	Includes: Fife Lake Outlet and Inlet Creek	Water
040601030207-01	Includes: Manistee River	Water
040601030207-02	Includes: Golden Creek and Morrisy Creek	Water
040601030207-03	Includes: Chase Creek	Water
040601030208-01	Includes: Manistee River	Water
040601030208-02	Includes: Walton Outlet	Water

AUID	Water Body Name	Basis of PCB Impairment
040601030208-03	Includes: Manton Creek	Water
040601030209-01	Includes: Manistee River	Water
040601030209-02	Includes: Sands Creek	Water
040601030209-03	Includes: Silver Creek	Water
040601030209-04	Includes: Buttermilk Creek	Water
040601030301-01	Includes: Anderson Creek and West Branch Anderson Creek	Water
040601030302-01	Includes: Manistee River	Water
040601030302-02	Includes: Filer Creek and Soper Creek	Water
040601030302-03	Includes: Blind Creek	Water
040601030302-04	Includes: Apple Creek	Water
040601030303-01	Includes: Manistee River	Water
040601030303-02	Includes: Unnamed Tributary to Manistee River, Unnamed Tributaries near M-115, Unnamed Tributary near 23 Road, and Unnamed Tributary near 26 Road	Water
040601030303-04	Includes: Cole Creek	Water
040601030303-05	Includes: Adams Creek	Water
040601030304-01	Includes: Cotton Creek and Fletcher Creek	Water
040601030305-02	Includes: Burkett Creek and Preston Creek	Water
040601030305-03	Includes: East Branch Wheeler Creek and Wheeler Creek	Water
040601030306-02	Includes: Cripple Creek, Manistee River, Seaton Creek and Tar Creek	Water
040601030306-04	Includes: Manistee River and Smail Creek	Water
040601030307-01	Includes: Perkins Creek and Slagle Creek	Water
040601030308-01	Includes: Manistee River	Water
040601030308-02	Includes: Eddington Creek	Water
040601030309-01	Includes: Johnson Creek and Peterson Creek	Water
040601030310-01	Includes: Manistee River	Water
040601030310-02	Includes: Unnamed Tributary near M-37, Unnamed Tributary near Pole Road, and Unnamed Tributary to Manistee River	Water
040601030310-03	Includes: Hinton Creek	Water
040601030310-04	Includes: Arquilla Creek	Water
040601030310-05	Includes: Cedar Creek	Water
040601030401-01	Includes: Unnamed Tributary to North Branch Pine River	Water
040601030401-02	Includes: North Branch Pine River	Water
040601030401-03	Includes: Fairchild Creek	Water
040601030401-04	Includes: SPALDING CREEK	Water
040601030402-01	Includes: Unnamed Tributary to Rose Lake	Water
040601030402-03	Includes: East Branch Pine River	Water
040601030402-04	Includes: Diamond Lake Outlet Creek, Lake Outlet and Rose Edgett Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601030403-01	Includes: Coe Creek and Dyer Creek	Water
040601030404-01	Includes: Little Beaver Creek and Sprague Creek	Water
040601030405-01	Includes: Sellers Creek	Water
040601030405-02	Includes: Dowling Creek and Poplar Creek	Water
040601030405-03	Includes: Silver Creek	Water
040601030405-04	Includes: Pine River	Water
040601030406-01	Includes: Hoxey Creek	Water
040601030406-02	Includes: Pine River	Water
040601030501-01	Includes: Dutchman Creek	Water
040601030501-02	Includes: Bear Creek, First Creek, Second Creek and Third Creek	Water
040601030502-01	Includes: Greens Creek and Little Bear Creek	Water
040601030503-01	Includes: Bear Creek and Lemon Creek	Water
040601030504-01	Includes: Bear Creek, Beaver Creek, Halls Creek, Horseshoe Creek and Little Beaver Creek	Water
040601030505-01	Includes: Bear Creek, Boswell Creek, Cedar Creek, Chicken Creek and Podunk Creek	Water
040601030601-01	Includes: North Branch Twin Creek, South Branch Twin Creek and Twin Creek	Water
040601030602-01	Includes: Lincoln Creek, Little Manistee River and Manistee Creek	Water
040601030602-02	Includes: Unnamed Tributary to Rockwell Lake	Water
040601030603-01	Includes: Cool Creek and Stronach Creek	Water
040601030604-01	Includes: Little Manistee River and Syers Creek	Water
040601030605-01	Includes: Little Manistee River	Water
040601030606-01	Includes: Little Manistee River	Water
040601030701-01	Includes: Manistee River	Water
040601030701-02	Includes: Manistee River	Water
040601030702-01	Includes: Manistee River	Water
040601030702-02	Includes: Pine Creek	Water
040601030702-03	Includes: Deer Lake Bayou, Sergant Bayou, and Unnamed Tributary to Manistee River	Water
040601030703-01	Includes: Manistee River	Water
040601030703-02	Includes: Chief Creek and Larson Creek	Water
040601030703-03	Includes: Sickle Creek	Water
040601030704-01	Includes: Manistee River	Water
040601030704-02	Includes: Claybank Creek	Water
040601030705-03	Includes: Manistee River	Water
040601050501-01	Includes: Crofton Creek, Failing Creek, Hauenstein Creek, North Branch Boardman River and Palmer Creek	Water
040601050502-01	Includes: South Branch Boardman River and Taylor Creek	Water
040601050503-01	Includes: North Branch Boardman River	Water
040601050504-01	Includes: Boardman River, Carpenter Creek and Twentytwo Creek	Water
040601050505-01	Includes: Bancroft Creek, East Creek, Jackson Creek and Parker Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601050506-03	Includes: Boardman River, Jaxon Creek and Swainston Creek	Water
040601050507-06	Includes: Boardman River, Beitner Creek and Jack's Creek	Water
040601050507-08	Includes: Boardman River	Water
040601060101-02	Includes: Strom Creek	Water
040601060101-03	Includes: Shoepac River and Wolf Creek	Water
040601060101-04	Includes: Norton Creek	Water
040601060101-05	Includes: Taylor Creek	Water
040601060102-01	Includes: Black Creek	Water
040601060103-02	Includes: Fork Creek, Helmer Creek, Locke Creek and Portage Creek	Water
040601060201-01	Includes: Grass Creek, Loon Creek and Pelican Creek	Water
040601060202-01	Includes: Unnamed Tributaries to Pickerel Lake and Second Lake (Alger County), Unnamed Tributary to Stanley Lake, and Unnamed Lake Outlet (Schoocraft County)	Water
040601060202-04	Includes: Little Fox River	Water
040601060202-05	Includes: Casey Creek	Water
040601060203-01	Includes: Hudson Creek	Water
040601060204-01	Includes: Camp Seven Creek, East Branch Fox River, Haymeadow Creek and Snyder Creek	Water
040601060204-03	Includes: Clear Creek	Water
040601060205-01	Includes: Cold Creek, Deer Creek, East Branch Fox River and Spring Creek	Water
040601060206-01	Includes: Bev Creek and East Branch Fox River	Water
040601060207-01	Includes: Dead Creek	Water
040601060301-02	Includes: Driggs River and Negro Creek	Water
040601060301-03	Includes: Bear Creek, Black Creek, Driggs River, Mahoney Creek and Ross Creek	Water
040601060302-01	Includes: Walsh Creek	Water
040601060303-01	Includes: Marsh Creek, Unnamed Tributaries to Marsh Creek, and Walsh Ditch	Water
040601060304-01	Includes: Unnamed Tributaries to Walsh Ditch and Walsh Ditch	Water
040601060305-01	Includes: Clarks Ditch, Holland Ditch, and Unnamed Tributaries to Holland Ditch	Water
040601060306-01	Includes: Delta Creek and Driggs River	Water
040601060307-02	Includes: Mead Creek and Tad Creek	Water
040601060307-03	Includes: Toms Creek	Water
040601060308-01	Includes: Unit Number 1 Diversion Ditch and Unit Number 2 Diversion Ditch	Water
040601060308-02	Includes: Grays Creek, Manistique River and Sand Creek	Water
040601060308-03	Includes: Holland Creek and Manistique River	Water
040601060309-01	Includes: Black Creek and Duck Creek	Water
040601060310-01	Includes: Boucher Creek, Dougal Creek and Manistique River	Water
040601060310-02	Includes: Mezik Creek	Water
040601060310-03	Includes: Marsh Creek and Unnamed Tributaries to Mezik Creek	Water
040601060401-01	Includes: Beaver Creek and North Branch Stutts Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040601060402-01	Includes: Fenton Creek and Middle Branch Stutts Creek	Water
040601060403-01	Includes: North Branch Stutts Creek	Water
040601060404-01	Includes: South Branch Stutts Creek and Stutts Creek	Water
040601060405-01	Includes: Metser Creek and Star Creek	Water
040601060406-01	Includes: Creighton River, Shotgun Creek and Stoner Creek	Water
040601060407-01	Includes: Creighton River	Water
040601060408-01	Includes: Hickey Creek, Prairie Creek and Stony Creek	Water
040601060409-01	Includes: Commencement Creek, Pine Creek, Section Nineteen Creek and West Branch Manistique River	Water
040601060410-01	Includes: Hickey Creek and West Branch Hickey Creek	Water
040601060411-01	Includes: Bear Slough, Brace Creek, Hay Meadow Creek, Hiawatha Creek and Stutts Creek	Water
040601060412-01	Includes: Hay Meadow Creek and West Branch Manistique River	Water
040601060501-01	Includes: Indian River and Squaw Creek	Water
040601060502-01	Includes: Grassy Creek and Little Indian River	Water
040601060503-01	Includes: Deer Creek, Grassy Creek and Indian River	Water
040601060503-04	Includes: Delias Run	Water
040601060504-01	Includes: Indian River, Leg Creek and Little Murphy Creek	Water
040601060505-01	Includes: Bear Creek and Carr Creek	Water
040601060505-02	Includes: Big Murphy Creek	Water
040601060506-01	Includes: Indian River and Iron Creek	Water
040601060507-02	Includes: The Big Ditch and Unnamed Tributaries to The Big Ditch	Water
040601060508-01	Includes: Smith Creek	Water
040601060509-02	Includes: Indian River	Water
040601060601-01	Includes: East Branch Bear Creek, Little Bear Creek and Pelky Creek	Water
040601060602-01	Includes: Clemons Creek, Little Duck Creek, Manistique River and Merwin Creek	Water
040601060603-02	Includes: Sturgeon Hole Creek	Water
040700020201-01	Includes: Lumpson Creek and Pine River	Water
040700020202-01	Includes: Blind Biscuit Creek, Hemlock Creek and Pine River	Water
040700020203-01	Includes: Biscuit Creek and Trout Brook	Water
040700020204-01	Includes: North Pine River, Prey Creek and Sullivan Creek	Water
040700020205-01	Includes: Black Creek, South Branch Black Creek and Sweiger Creek	Water
040700020206-01	Includes: North Pine River	Water
040700020207-01	Includes: Bear Creek and Little Bear Creek	Water
040700020207-02	Includes: Bear Creek	Water
040700020208-01	Includes: Chub Creek	Water
040700020209-01	Includes: Pine River	Water
040700020210-01	Includes: Elmhirst Creek, Hiawatha Run, Pine River and Silver Creek	Water
040700020211-01	Includes: Crooked Creek, Garden Hill Creek, Home Creek, Pine River and Rock Spring Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040700040101-01	Includes: Sturgeon River	Water
040700040102-01	Includes: Club Stream	Water
040700040103-02	Includes: West Branch Sturgeon River	Water
040700040104-01	Includes: Pickerel Creek and Sturgeon River	Water
040700040105-01	Includes: Allen Creek, Marl Creek and West Branch Sturgeon River	Water
040700040106-01	Includes: Allen Creek, Blackjack Creek, Stewart Creek and Sturgeon River	Water
040700040107-01	Includes: Beebe Creek and Sturgeon River	Water
040700040201-01	Includes: Minnehaha Creek, Silver Creek and West Branch Minnehaha Creek	Water
040700040202-01	Includes: Cedar Creek and Mud Creek	Water
040700040203-01	Includes: Brush Creek	Water
040700040204-01	Includes: Maple River	Water
040700040205-01	Includes: Lancaster Creek	Water
040700040205-02	Includes: Certon Creek and Cope Creek	Water
040700040206-01	Includes: Cold Creek and Maple River	Water
040700040207-01	Includes: Maple River	Water
040700040208-02	Includes: Crooked River, McPhee Creek and Whites Creek	Water
040700040209-01	Includes: Hasler Creek, Little Carp River and Maple River	Water
040700040301-01	Includes: Pigeon River and South Branch Pigeon River	Water
040700040302-01	Includes: Pigeon River	Water
040700040303-01	Includes: Cornwall Creek and Pigeon River	Water
040700040304-01	Includes: Little Pigeon River	Water
040700040305-01	Includes: Little Pigeon River and Pigeon River	Water
040700040306-01	Includes: Kimberly Creek, Little Pigeon River, Middle Branch Little Pigeon River, Morrow Creek and North Branch Little Pigeon River	Water
040700040307-01	Includes: Pigeon River and Wilkes Creek	Water
040700040401-01	Includes: Johnson Creek and Little Sturgeon River	Water
040700040402-01	Includes: Mullett Creek	Water
040700040402-02	Includes: Mullett Creek	Water
040700040403-01	Includes: Indian River, Scott Creek and Sturgeon River	Water
040700040404-01	Includes: Cheboygan River, Huron, Lake, Laperell Creek and Tannery Gully	Water
040700050101-01	Includes: West Branch Upper Rainy River	Water
040700050102-01	Includes: Little Rainy River	Water
040700050103-01	Includes: East Branch Rainy River and Rainy River	Water
040700050104-01	Includes: Rainy River	Water
040700050104-02	Includes: Cold Creek	Water
040700050201-01	Includes: Black River and Saunders Creek	Water
040700050202-01	Includes: Black River	Water

AUID	Water Body Name	Basis of PCB Impairment
040700050203-01	Includes: East Branch Black River and Rattlesnake Creek	Water
040700050204-01	Includes: Black River and Stewart Creek	Water
040700050205-01	Includes: Little McMasters Creek, McMasters Creek and West McMasters Creek	Water
040700050206-01	Includes: Canada Creek, Montague Creek, Packer Creek and Van Hetton Creek	Water
040700050207-01	Includes: Canada Creek and Oxbow Creek	Water
040700050208-02	Includes: Tomahawk Creek	Water
040700050209-01	Includes: Black River	Water
040700050210-01	Includes: Gokee Creek, Lewis Branch Adair Creek, Milligan Creek and Weed Creek	Water
040700050211-01	Includes: Black River and Gregg Creek	Water
040700050212-01	Includes: Adair Creek, Milligan Creek and Stony Creek	Water
040700050213-01	Includes: Black River, Bowen Creek and Sturgis Creek	Water
040700050213-02	Includes: Black River and Welch Creek	Water
040700050301-01	Includes: Mud Creek	Water
040700050302-02	Includes: Black River, Fisher Creek and Stewart Creek	Water
040700050303-02	Includes: Black River, Long Lake Creek and Owens Creek	Water
040700050304-01	Includes: Black River and Myers Creek	Water
040700060101-01	Includes: Beaver Creek, Indian Creek and Rayburn Creek	Water
040700060102-01	Includes: Bruster Creek, McGinn Creek and Robbs Creek	Water
040700060103-01	Includes: Bear Creek, Little Wolf Creek, Mohr Creek, Silver Brook, Silver Creek, Wildcat Creek and Yoder Creek	Water
040700060104-01	Includes: Butterfield Creek, Davis Creek, Widner Creek and Wolf Creek	Water
040700060105-01	Includes: Evans Creek, Schmitt Creek and Wolf Creek	Water
040700060201-01	Includes: Marsh Creek, Unnamed Tributaries to Marsh Creek, and Unnamed Tributary near Weaver Road	Water
040700060202-01	Includes: Pike Creek and Upper South Branch Thunder Bay River	Water
040700060203-01	Includes: Bullock Creek, Cole Creek, Turtle Creek, Upper South Branch Thunder Bay River and Weber Creek	Water
040700060204-01	Includes: Upper South Branch Thunder Bay River	Water
040700060301-01	Includes: Barger Creek, Sheridan Creek, Stanniger Creek and Thunder Bay River	Water
040700060302-01	Includes: Smith Creek from Thunder Bay River confluence upstream to Voyer Lake	Water
040700060302-02	Includes: Smith Creek from Voyer Lake upstream to Headwaters and Thunder Bay River	Water
040700060302-03	Includes: Haymeadow Creek	Water
040700060303-01	Includes: Fuller Creek, Hunt Creek and Sage Creek	Water
040700060304-01	Includes: Crooked Creek and Thunder Bay River	Water
040700060305-01	Includes: Gilchrist Creek, Greasy Creek, Lockwood Creek and Nugent Creek	Water
040700060306-01	Includes: Miller Creek and Unnamed Tributaries to Miller Creek	Water
040700060307-01	Includes: Thunder Bay River	Water
040700060308-02	Includes: Brush Creek and Little Brush Creek	Water
040700060309-01	Includes: Sucker Creek and Thunder Bay River	Water
040700060310-01	Includes: Anchor Creek, Jewett Creek and Thunder Bay River	Water

AUID	Water Body Name	Basis of PCB Impairment
040700060401-01	Includes: North Branch Thunder Bay River	Water
040700060402-01	Includes: Quinn Creek	Water
040700060403-01	Includes: North Branch Thunder Bay River	Water
040700060404-01	Includes: North Branch Thunder Bay River	Water
040700060405-01	Includes: Erskine Creek, North Branch Thunder Bay River and Thunder Bay River	Water
040700060501-01	Includes: Little North Creek	Water
040700060502-01	Includes: Buff Creek, Cold Creek, Comstock Creek and West Branch River	Water
040700060503-01	Includes: Fish Creek, Pettis Creek, Sucker Creek and Vincent Creek	Water
040700060504-01	Includes: Holcomb Creek, North Branch Holcomb Creek and Stevens Creek	Water
040700060505-01	Includes: Big Ravine Creek, Lower South Branch Thunder Bay River and Simmons Creek	Water
040700060506-01	Includes: Butterfield Creek, Lower South Branch Thunder Bay River and Robinson Creek	Water
040700060507-01	Includes: King Creek, Lower South Branch Thunder Bay River and Thunder Bay River	Water
040700060601-01	Includes: Truax Creek	Water
040700060602-01	Includes: Bean Creek	Water
040700060603-01	Includes: Gaffney Creek and Thunder Bay River	Water
040700060604-02	Includes: Kingsbury Creek and Thunder Bay River	Water
040700070101-01	Includes: Cameron Creek, Cedar Creek, Marsh Creek and Russell Creek	Water
040700070102-01	Includes: East Creek	Water
040700070103-01	Includes: South Branch Au Sable River and South Creek	Water
040700070104-01	Includes: Robinson Creek	Water
040700070105-01	Includes: Beaver Creek	Water
040700070106-01	Includes: Beaver Creek	Water
040700070106-02	Includes: Unnamed Tributary to South Branch Au Sable River	Water
040700070107-01	Includes: Asum Creek, Hudson Creek and South Branch Au Sable River	Water
040700070108-01	Includes: Thayer Creek	Water
040700070109-01	Includes: Douglas Creek, Hickey Creek and South Branch Au Sable River	Water
040700070110-01	Includes: Sauger Creek and South Branch Au Sable River	Water
040700070202-01	Includes: Chub Creek	Water
040700070203-01	Includes: North Branch Au Sable River and Turtle Creek	Water
040700070204-01	Includes: West Branch Big Creek	Water
040700070205-01	Includes: East Branch Big Creek	Water
040700070206-01	Includes: Middle Branch Big Creek	Water
040700070207-01	Includes: Crapo Creek and North Branch Au Sable River	Water
040700070208-01	Includes: West Branch Big Creek	Water
040700070209-01	Includes: Big Creek and East Branch Big Creek	Water
040700070209-02	Includes: Wright Creek	Water
040700070210-01	Includes: Carter Creek and North Branch Au Sable River	Water

AUID	Water Body Name	Basis of PCB Impairment
040700070301-01	Includes: Kolke Creek inlet to Lake Tecon	Water
040700070302-01	Includes: Bradford Creek	Water
040700070303-01	Includes: Kolke Creek	Water
040700070304-01	Includes: Unnamed Tributary to the East Branch Au Sable River	Water
040700070305-01	Includes: East Branch Au Sable River	Water
040700070305-02	Includes: East Branch Au Sable River	Water
040700070306-01	Includes: Au Sable River	Water
040700070306-02	Includes: Au Sable River and Simpson Creek	Water
040700070308-01	Includes: Au Sable River	Water
040700070309-01	Includes: Au Sable River, Barker Creek and Wakeley Creek	Water
040700070310-01	Includes: Au Sable River	Water
040700070401-01	Includes: Unnamed Tributary to the East Branch Big Creek	Water
040700070402-01	Includes: Unnamed Tributary to the East Branch Big Creek	Water
040700070403-01	Includes: Hunt Creek	Water
040700070404-01	Includes: West Branch Big Creek	Water
040700070405-01	Includes: East Branch Big Creek	Water
040700070406-01	Includes: Big Creek, Red Creek and West Branch Big Creek	Water
040700070501-01	Includes: Unnamed Tributary to Sohn Creek	Water
040700070501-02	Includes: Beaver Creek	Water
040700070501-03	Includes: Sohn Creek	Water
040700070501-04	Includes: Au Sable River, Gammey Creek and Whitewater Creek	Water
040700070502-01	Includes: Au Sable River, Honeywell Creek and Lost Creek	Water
040700070502-03	Includes: Antler Creek and Au Sable River	Water
040700070502-04	Includes: Au Sable River and Honeywell Creek	Water
040700070503-01	Includes: Gusler Creek, Joslin Creek and Perry Creek	Water
040700070503-02	Includes: Perry Creek	Water
040700070504-01	Includes: Au Sable River, Cauchy Creek and Cherry Creek	Water
040700070504-02	Includes: Loud Creek	Water
040700070504-03	Includes: Wolf Creek	Water
040700070504-04	Includes: Cherry Creek	Water
040700070505-01	Includes: Comins Creek	Water
040700070505-02	Includes: Au Sable River and Glennie Creek	Water
040700070601-01	Includes: Bryant Creek and Wallace Creek	Water
040700070602-01	Includes: McGillis Creek	Water
040700070603-01	Includes: West Branch Pine River	Water
040700070603-02	Includes: Backus Creek	Water
040700070603-03	Includes: LOUD CREEK	Water

AUID	Water Body Name	Basis of PCB Impairment
040700070604-01	Includes: Pine River	Water
040700070604-02	Includes: East Branch Pine River	Water
040700070604-03	Includes: East Branch Pine River	Water
040700070605-01	Includes: Kurtz Creek, McDonald Creek, Samyn Creek, South Branch Pine River and Vandercook Creek	Water
040700070606-01	Includes: Grey Creek	Water
040700070606-02	Includes: Roy Creek	Water
040700070607-01	Includes: Van Etten Creek	Water
040700070607-02	Includes: Tributaries to Van Etten Creek	Water
040700070608-01	Includes: Pine River	Water
040700070608-02	Includes: Duval Creek	Water
040700070609-01	Includes: Dry Creek, Phelan Creek and Van Etten Creek	Water
040700070609-02	Includes: Pine River	Water
040700070609-03	Includes: Coppler Creek and Hill Creek	Water
040700070701-01	Includes: BLOCKHOUSE CREEK	Water
040700070701-02	Includes: Ninemile Creek	Water
040700070701-03	Includes: Au Sable River	Water
040700070702-01	Includes: Au Sable River	Water
040700070703-01	Includes: Wilbur Creek	Water
040700070703-02	Includes: Wilbur Creek	Water
040700070704-02	Includes: Au Sable River	Water
040700070704-04	Includes: Bamfield Creek	Water
040700070705-02	Includes: Au Sable Creek, Harper Creek, Hubble Creek, Lime Creek, Mink Creek and South Branch River	Water
040700070706-02	Includes: Au Sable River, Baker Creek and Smith Creek	Water
040700070706-03	Includes: Smith Creek	Water
040700070706-04	Includes: Hoppy Creek and Stewart Creek	Water
040700070707-01	Includes: Au Sable River	Water
040700070708-02	Includes: Au Sable River and Wildcat Creek	Water
040801010302-01	Includes: Hope Creek	Water
040801010302-02	Includes: Au Gres River	Water
040801010302-03	Includes: Nester Creek	Water
040801010303-01	Includes: Au Gres River, Latter Creek and Porterfield Creek	Water
040801010304-01	Includes: Johnson Creek	Water
040801010304-02	Includes: Johnson Creek	Water
040801010304-03	Includes: Whitney Creek	Water
040801010304-04	Includes: Crainer Creek	Water
040801010305-01	Includes: Au Gres River, County Line Drain and Scott Drain	Water

AUID	Water Body Name	Basis of PCB Impairment
040801010305-03	Includes: Au Gres River	Water
040801010305-04	Includes: Elm Creek	Water
040801010306-01	Includes: Au Gres River	Water
040801010306-02	Includes: CEDAR CREEK DRAIN	Water
040801010307-01	Includes: Au Gres River and Burnt Drain	Water
040801020201-01	Includes: Kawkawlin Creek and North Branch Kawkawlin River	Water
040801020202-01	Includes: Waldo Drain	Water
040801020203-01	Includes: Kawkawlin River	Water
040801020204-01	Includes: Bradford Creek, Dell Creek, Hoppler Creek, Kawkawlin River, Kindell Drain and Perry Creek	Water
040801020205-01	Includes: Crump Drain, Kawalski Drain, Monison Drain, North Branch Kawkawlin River and Renner Drain	Water
040801020205-03	Includes: Hembling Drain, McNally Drain, and Unnamed Tributaries to Hembling Drain	Water
040801020206-01	Includes: Culver Creek	Water
040801020206-02	Includes: Kawkawlin River	Water
040801030301-01	Includes: Bope Drain, Cameron Drain, Colfax Drain, Colona Drain, Linton Drain, McLean Drain, Pinnebog Drain, Rush Drain, Sandy Drain, Slack Drain, Unnamed Tributaries to Cameron Drain, Unnamed Tributaries to Colfax Drain, Unnamed Tributaries to Colona D	Water
040801030302-01	Includes: Bad Axe Creek, Bad Axe Drain, Richardson Drain, Symons Drain, Unnamed Tributaries to Bad Axe Creek, Unnamed Tributaries to Bad Axe Drain, and Unnamed Tributaries to Symons Drain	Water
040801030302-02	Includes: Bad Axe Creek, Bad Axe Drain, Richardson Drain, Symons Drain, Unnamed Tributaries to Bad Axe Creek, Unnamed Tributaries to Bad Axe Drain, and Unnamed Tributaries to Symons Drain upstream of Thomas Road	Water
040801030303-01	Includes: Bortman Creek, Moore Creek and Schram Branch	Water
040801030304-01	Includes: Silver Creek	Water
040801030304-02	Includes: Harrison Drain, Musselman Drain, Pinnebog River, Unnamed Tributaries to Musselman Drain, and Unnamed Tributaries to Pinnebog River	Water
040802010101-01	Includes: Avery Creek, Chatman Creek, Edwards Creek, Indian Lake Creek, Mansfield Creek, Middle Branch Tittabawassee River, Noren Creek, Parren Creek and Perrys Creek	Water
040802010102-01	Includes: Cooks Creek, East Branch Tittabawassee River, LaPorte Creek, Ray Creek and Spring Creek	Water
040802010103-01	Includes: Lake Four Outlet, Muma Creek and West Branch Tittabawassee River	Water
040802010104-01	Includes: Elk Lake Creek and Tittabawassee River	Water
040802010201-01	Includes: Cedar River and Cranberry Creek	Water
040802010201-02	Includes: Popple Creek and West Branch Cedar River	Water
040802010201-03	Includes: Middle Branch Cedar River	Water
040802010202-01	Includes: North Branch Cedar River	Water
040802010203-01	Includes: Cedar River upstream of Wiggins Lake, Howland Creek and Smith Creek	Water
040802010204-01	Includes: Cedar River downstream of Wiggins Lake, Doone Creek and Silver Creek	Water
040802010301-01	Includes: Loon Lake Creek, Newton Creek and Runyon Creek	Water
040802010302-01	Includes: Elm Creek and South Branch Tobacco River	Water
040802010303-01	Includes: Five Lakes Creek, McCuran Creek and South Branch Tobacco River	Water

AUID	Water Body Name	Basis of PCB Impairment
040802010303-02	Includes: Duncan Drain, Gorr Drain, McKinnon Drain, and Unnamed Tributary to South Branch Tobacco River	Water
040802010304-01	Includes: Bailey Creek, Davidson Creek and South Branch Tobacco River	Water
040802010304-02	Includes: Carrow Creek	Water
040802010305-01	Includes: Clear Creek and Middle Branch Tobacco River	Water
040802010305-02	Includes: Middle Branch Tobacco River	Water
040802010306-01	Includes: Beaver Creek, Jose Creek, Mostellar Creek, North Branch Tobacco River and Spike Horn Creek	Water
040802010307-01	Includes: North Branch Tobacco River	Water
040802010307-02	Includes: Howe Creek and North Branch Tobacco River	Water
040802010308-01	Includes: Dow Creek and Little Cedar River	Water
040802010309-01	Includes: Most Downstream Segment of the Tobacco River at Wixom Lake, and Nestor and Coolidge Drains	Water
040802010309-02	Includes: Tobacco River below Ross Lake, and Bear and Venison Creeks	Water
040802010401-01	Includes: Long Lake Creek and Sugar River	Water
040802010402-01	Includes: South Branch Little Sugar River	Water
040802010402-02	Includes: Sugar River	Water
040802010403-01	Includes: Tea Creek and Tittabawassee River	Water
040802010403-03	Includes: Little Tobacco River and Tittabawassee River	Water
040802010404-01	Includes: Fish Creek and Little Molasses River	Water
040802010405-01	Includes: Molasses River	Water
040802010406-01	Includes: Guernsey Creek, Larrabee Creek and Tittabawassee River	Water
040802010406-02	Includes: Black Creek	Water
040802010406-03	Includes: Larrabee Creek	Water
040802010407-01	Includes: Davids Drain, Fowley Drain, Hess Drain, Payne Creek and Tittabawassee River	Water
040802010501-01	Includes: Jordon Creek and Spring Creek	Water
040802010502-01	Includes: North Branch Salt River	Water
040802010503-01	Includes: South Branch Salt River	Water
040802010504-01	Includes: North Branch Salt River	Water
040802010505-01	Includes: Bickerton Drain, Bluff Creek, Bliss Drain, High Drain, Howe Drain, and Unnamed Tributaries to Bluff Creek	Water
040802010506-01	Includes: Howard Creek and Salt River	Water
040802010507-01	Includes: Salt River	Water
040802010604-04	Includes: Snake Creek	Water
040802020101-01	Includes: Three Lake Creek	Water
040802020102-02	Includes: Atkinson Creek, Benjamin Creek and North Branch Chippewa River	Water
040802020103-01	Includes: Butts Creek, North Branch Chippewa River and Rattail Creek	Water
040802020104-01	Includes: Chippewa Creek	Water
040802020104-02	Includes: Brown Creek, Helmer Creek and West Branch Chippewa River	Water
040802020201-01	Includes: Bamber Creek, Chippewa River, Sherman Creek, Tanner Creek and West Branch Chippewa River	Water
040802020202-01	Includes: Chippewa River, Indian Creek and Squaw Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040802020203-01	Includes: Delaney Creek and Walker Creek	Water
040802020204-01	Includes: Coldwater River	Water
040802020204-02	Includes: Coldwater River	Water
040802020204-04	Includes: Coldwater River	Water
040802020204-05	Includes: Walker Creek	Water
040802020204-08	Includes: Sucker Creek	Water
040802020205-01	Includes: North Branch Chippewa River, Stevenson Lake Tributaries and outlet	Water
040802020205-02	Includes: North Branch Chippewa River	Water
040802020205-03	Includes: North Branch Chippewa River	Water
040802020205-05	Includes: Schofield Creek	Water
040802020206-01	Includes: North Branch Chippewa River	Water
040802020206-02	Includes: Hogg Creek	Water
040802020206-03	Includes: North Branch Chippewa River	Water
040802020207-01	Includes: Chippewa River, Johnson Creek and Stony Brook	Water
040802020301-01	Includes: Pony Creek	Water
040802020301-03	Includes: Pony Creek	Water
040802020302-01	Includes: Miller Creek and Pine River	Water
040802020303-01	Includes: Pine River and Skunk Creek	Water
040802020303-02	Includes: Decker Creek and South Branch Pine River	Water
040802020303-03	Includes: Jewel Creek	Water
040802020304-01	Includes: Wolf Creek	Water
040802020305-01	Includes: Pine River	Water
040802020306-01	Includes: North Branch Pine River and Thatcher Creek	Water
040802020306-02	Includes: North Branch Pine River	Water
040802020306-03	Includes: Unnamed Tributary to the North Branch Pine River	Water
040802020307-01	Includes: Pine River and Tyman Branch	Water
040802020307-02	Includes: Mud Creek and Bass Lake Drain	Water
040802020308-01	Includes: Pine River	Water
040802020308-02	Includes: Carpenter Creek	Water
040802020309-01	Includes: Pine River	Water
040802020309-02	Includes: Unnamed Tributary to Pine River	Water
040802020310-01	Includes: Coles Creek and Unnamed Tributaries to Coles Creek	Water
040802020311-01	Includes: Honeyoey Creek	Water
040802020312-01	Includes: Pine River	Water
040802020312-02	Includes: Newark and Arcadia Drain and Unnamed Tributaries to Newark and Arcadia Drain	Water
040802020401-01	Includes: Upper Bush Creek, Rook Drain, Unnamed Tributaries to Bush Creek, and Unnamed Tributaries to Rook Drain	Water
040802020402-01	Includes: Lower Bush Creek, Taylor Drain, Unnamed Tributaries to Bush Creek, and Unnamed Tributaries to Taylor Drain	Water

AUID	Water Body Name	Basis of PCB Impairment
040802020403-01	Includes: Pine River	Water
040802020403-02	Includes: Sugar Creek	Water
040802020403-03	Includes: Pine River	Water
040802020403-05	Includes: Horse Creek	Water
040802020404-01	Includes: Pine River and Sucker Creek	Water
040802020404-02	Includes: Pine River	Water
040802030103-02	Includes: South Branch Shiawassee River	Water
040802030105-01	Includes: Cranberry Creek	Water
040802030105-02	Includes: YELLOW RIVER DRAIN	Water
040802030105-04	Includes: Unnamed Tributary to Fausett Lake and Unnamed Tributary to Indian Lake	Water
040802030106-01	Includes: North Ore Creek	Water
040802030107-02	Includes: Buckhorn Creek and Shiawassee River	Water
040802030107-07	Includes: Shiawassee River	Water
040802030108-02	Includes: Shiawassee River	Water
040802030109-02	Includes: North Ore Creek	Water
040802030201-01	Includes: Atherton Drain, Jones Creek and Porter Drain	Water
040802030203-01	Includes: Hovey Drain	Water
040802030203-02	Includes: THREE MILE CREEK	Water
040802030203-03	Includes: Burns and Vernon Drain, Holly Drain, Mikan Drain, Unnamed Tributaries to Burns and Vernon Drain, and Unnamed Tributaries to Holly Drain	Water
040802030204-01	Includes: Jones Creek and Webb Creek	Water
040802030204-02	Includes: WEBB CREEK	Water
040802030208-01	Includes: Mickles Creek and Unnamed Tributary to Mickles Creek	Water
040802030208-02	Includes: Sixmile Creek	Water
040802030208-03	Includes: North State Drain and Unnamed Tributaries to North State Drain	Water
040802030305-01	Includes: Potato Creek	Water
040802030305-02	Includes: Potato Creek	Water
040802030306-01	Includes: Bearwallow Creek and Potato Creek	Water
040802030307-01	Includes: Beaver Creek and Beaver Drain	Water
040802030308-01	Includes: Beaver Creek	Water
040802030311-01	Includes: Beaver Creek and Morgan Creek	Water
040802030312-01	Includes: Pickerel Creek	Water
040802030401-01	Includes: Albert Drain, Bear Creek, East Branch Albert Drain, Fairchild Creek, Unnamed Tributaries to Albert Drain, Unnamed Tributaries to Bear Creek, Unnamed Tributaries to Fairchild Creek, Unnamed Tributaries to Wickham Drain, and Wickham Drain	Water
040802030402-01	Includes: SWAN CREEK	Water
040802030403-01	Includes: SWAN CREEK	Water
040802030404-01	Includes: Handy Creek and Whitmore Drain	Water
040802030405-01	Includes: Nelson Run, Weeks Drain and Whitmore Drain	Water

AUID	Water Body Name	Basis of PCB Impairment
040802030406-01	Includes: Swan Creek	Water
040802030407-01	Includes: Unnamed Tributary near Gratiot Road	Water
040802030407-02	Includes: Beebe Drain and Unnamed Tributaries to Beebe Drain	Water
040802030407-03	Includes: Williams Creek	Water
040802030407-04	Includes: Swan Creek	Water
040802030407-05	Includes: MCCLELLAN RUN	Water
040802030408-01	Includes: Marsh Creek	Water
040802030409-01	Includes: Birch Run, Cole Drain and Horton Graham Drain	Water
040802030410-02	Includes: Ferguson Bayou	Water
040802030410-04	Includes: Unnamed Tributaries to Shiawassee River	Water
040802030410-05	Includes: Marsh Creek	Water
040802040101-01	Includes: South Branch Flint River and Whigville Creek	Water
040802040101-02	Includes: South Branch Flint River	Water
040802040102-01	Includes: Hunters Creek	Water
040802040102-02	Includes: Hunters Creek and Kintz Creek	Water
040802040103-01	Includes: Unnamed Tributary to the South Branch Flint River	Water
040802040103-02	Includes: Bishop Drain and Unnamed Tributary to Bishop Drain	Water
040802040103-03	Includes: Pine Creek	Water
040802040103-04	Includes: UNNAMED DRAINS, LAPEER TWP.	Water
040802040103-05	Includes: South Branch Flint River	Water
040802040103-06	Includes: South Branch Flint River	Water
040802040103-07	Includes: South Branch Flint River	Water
040802040104-01	Includes: Farmers Creek	Water
040802040104-04	Includes: Farmers Creek and Poplar Creek	Water
040802040104-05	Includes: Mill Creek and Spring Bank Creek	Water
040802040104-06	Includes: South Branch Farmers Creek	Water
040802040105-01	Includes: Unnamed Tributaries to South Branch Flint River	Water
040802040105-02	Includes: South Branch Flint River	Water
040802040105-03	Includes: PLUM CREEK	Water
040802040106-01	Includes: Sand Hill Drain and South Branch Flint River	Water
040802040201-01	Includes: Cedar Creek and Elm Creek	Water
040802040202-02	Includes: Bottom Creek and North Branch Flint River	Water
040802040202-03	Includes: PLUM CREEK	Water
040802040202-04	Includes: Gravel Creek	Water
040802040203-01	Includes: Indian Creek	Water
040802040204-01	Includes: North Branch Flint River, Wilson Drain, North Branch Drain and Hobson Drain	Water
040802040205-01	Includes: Silver Creek and Squaw Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040802040206-01	Includes: Evergreen Creek and Squaw Creek	Water
040802040207-01	Includes: North Branch Flint River and Fitch Drain	Water
040802040208-01	Includes: Forest Drain, Joslyn Drain, Kester Drain and North Branch Flint River	Water
040802040208-03	Includes: Crystal Creek	Water
040802040301-01	Includes: Kimball Drain, Lum Drain, and Unnamed Tributaries to Kimball Drain	Water
040802040302-01	Includes: Swartz Creek	Water
040802040303-01	Includes: Thread Creek and Zimmerman Branch	Water
040802040304-01	Includes: West Branch Swartz Creek, Hewitt Drain and Howland Drain	Water
040802040305-01	Includes: Swartz Creek and Seaver Drain	Water
040802040305-02	Includes: Indian Creek, Petry Branch and Dawe Drain	Water
040802040306-01	Includes: Thread Creek	Water
040802040307-01	Includes: Includes: Swartz Creek, Carman Creek, Gibson Drain and Sherwood Drain	Water
040802040307-02	Includes: Call Creek	Water
040802040401-01	Includes: Clute Drain, Flint River and Hemmingway and Whipple Drain	Water
040802040402-01	Includes: Hasler Creek	Water
040802040403-01	Includes: Flint River and unnamed tributaries	Water
040802040403-02	Includes: Flint River and Hasler Creek	Water
040802040403-03	Includes: Flint River and Henry Drain	Water
040802040404-01	Includes: Duck Creek and Kearsley Creek	Water
040802040405-01	Includes: Cartwright Drain, Kearsley Creek and Paddison Drain	Water
040802040406-01	Includes: Simon Branch	Water
040802040406-03	Includes: Black Creek	Water
040802040407-01	Includes: Barden Branch, Butternut Creek and Jackson Branch	Water
040802040408-01	Includes: Chipmunk Creek and Kearsley Creek	Water
040802040408-02	Includes: Kearsley Creek	Water
040802050201-01	Includes: North Branch White Creek	Water
040802050202-01	Includes: Mud Creek and North Branch White Creek	Water
040802050203-01	Includes: South Branch White Creek	Water
040802050203-02	Includes: Alder Creek and South Branch White Creek	Water
040802050204-01	Includes: White Creek	Water
040802050204-02	Includes: North Branch White Creek	Water
040802050206-01	Includes: Sucker Creek	Water
040802050206-02	Includes: Cox Drain, Phelps Lake Drain, Sucker Creek and Voght Drain	Water
040802050209-01	Includes: Cass River and H-M Drain	Water
040802050209-02	Includes: Evergreen Creek	Water
040802050209-03	Includes: Moore Drain	Water
040802050301-01	Includes: Goodings Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040802050302-01	Includes: Cole Creek and Perry Creek	Water
040802050303-01	Includes: Millington Creek	Water
040802050303-02	Includes: Cass River	Water
040802060103-01	Includes: Cheboyganing Creek, Creens Drain, English Drain, Trombley Drain, Unnamed Tributaries to Cheboygan Creek, Unnamed Tributaries to English Drain, and Unnamed Tributaries to Trombley Drain	Water
040900010101-02	Includes: Doggan Drain	Water
040900010102-02	Includes: MCMANUS DRAIN	Water
040900010103-01	Includes: Baerwolf Drain, Custer County Drain, Dwight Drain, Fye Drain, Kinney Drain, Stone Drain, Unnamed Tributaries to Custer County Drain, Unnamed Tributaries to Dwight Drain, Unnamed Tributaries to Fye Drain, and Unnamed Tributaries to Stone Drain	Water
040900010103-02	Includes: Berry Drain	Water
040900010105-01	Includes: Elk Creek, Hydorn Drain, Lapeer and Sanilac Drain, Scott Drain, Valley Center Drain, Varney Drain, Winters Drain, Witmer Drain, York Drain, Unnamed Tributaries to Elk Creek, Unnamed Tributaries to Lapeer and Sanilac Drain, Unnamed Tributaries to	Water
040900010106-01	Includes: Elk Creek, East Branch Speaker and Maple Valley Drain, Fletcher Drain, Bowers Drain, McGauley Drain, Shell Drain, Macklen Drain, Mullaney Drain and Weston Drain.	Water
040900010107-01	Includes: Elk Creek, McDonald Drain, Phillips Drain, Eagle Drain, Setter Drain, Welch Drain, and Unnamed Tributaries.	Water
040900010108-01	Includes: Elk Creek, Powers Drain, Elk Flynn and Maple Valley Drain, Jones Drain, Omard Drain, Smafield Drain, and Unnamed Tributaries.	Water
040900010109-01	Includes: Elk Creek, Beals and Fizzle Drain, Eggert Drain, Hale Drain, Severance Drain, Cummer Drain, Johns Barrett Drain, McElhinney Drain, Barr Drain, and Unnamed Tributaries.	Water
040900010110-01	Includes: Cork Drain, Engle Drain, French Drain, Hunt Drain, Potts Drain, Rickett Drain, Roskey Drain, Spring Creek Drain, Topping Drain, Unnamed Tributary to Cork Drain, Unnamed Tributaries to Engle Drain, Unnamed Tributaries to Potts Drain, Unnamed Trib	Water
040900010201-01	Includes: Black Creek, Jackson Creek, Lavell Drain, Livergood Drain, Robertson Drain, Unnamed Tributaries to Black Creek, Unnamed Tributaries to Jackson Creek, and Unnamed Tributaries to Lavell Drain	Water
040900010202-01	Includes: ELK CREEK	Water
040900010203-01	Includes: Eves Drain, Fueslin Drain, Hayes Drain, Jackson Drain, Silver Creek, Unnamed Tributaries to Eves Drain, Unnamed Tributaries to Jackson Drain, Unnamed Tributaries to Silver Creek, and Wilson Drain	Water
040900010204-01	Includes: Brant Lake Drain, Elk Lake Drain, Swamp Coners Drain, Unnamed Tributaries to Brant Lake Drain, Unnamed Tributaries to Elk Lake Drain, and Unnamed Tributary to Swamp Corners Drain	Water
040900010205-01	Includes: Elk Lake Creek, Madison Drain, North Branch Mill Creek, Stony Creek, Unnamed Tributaries to Madison Drain, Unnamed Tributaries to North Branch Mill Creek, and Unnamed Tributaries to Stony Creek	Water
040900010206-01	Includes: South Branch Mill Creek, Galley Drain, Kolb Drain, Sidel Drain, Franklin Drain, Mudcat Drain, Wendt Drain, Weitzig Drain, Jurn Drain, Bunde Drain, Brandy Drain, and Unnamed Tributaries.	Water
040900010207-01	Includes: Black Segate Reid Drain, Frasier Drain, Lynn Mussey Drain, South Branch Mill Creek, Unnamed Tributaries to Frasier Drain, Unnamed Tributaries to Lynn Mussey Drain, and Unnamed Tributaries to South Branch Mill Creek	Water
040900010208-01	Includes: Courter Drain, Flansburg Drain, North Branch Mill Creek, Root Drain, Unnamed Tributaries to Couter Drain, Unnamed	Water

AUID	Water Body Name	Basis of PCB Impairment
	Tributaries to North Branch Mill Creek, Unnamed Tributaries to Willoughby Drain, Watt Drain, and Willoughby Drain	
040900010209-01	Includes: Mill Creek, Sanilac and St. Clair Drain, Cole Drain, Downey Drain.	Water
040900010209-02	Includes: Mill Creek, Thompson Drain, Unnamed Tributaries.	Water
040900010209-03	Includes: MILL CREEK	Water
040900010209-04	Includes: Meharg Drain, Middleton Drain, Mill Creek, Unnamed Tributaries to Meharg Drain, and Unnamed Tributaries to Mill Creek	Water
040900010210-01	Includes: Mill Creek, Sheehy Drain, Thody Drain, and Unnamed Tributaries.	Water
040900010210-02	Includes: Mill Creek, White Drain, and Unnamed Tributaries.	Water
040900010212-01	Includes: MILL CREEK	Water
040900030101-01	Includes: Bridge Lake Outlet, Clinton River, Parke Lake Outlet, Seymour Lake Outlet, Upper Bushman Lake Outlet, Unnamed Tributary to Bridge Lake Outlet, Unnamed Tributaries to Parke Lake Outlet, and Unnamed Tributaries to Seymour Lake Outlet	Water
040900030102-01	Includes: Elkhorn Lake Outlet, Greens Lake Outlet, Sashabaw Creek, Tommys Lake Outlet, Unnamed Tributary to Lake Sixteen, Unnamed Tributary to Sashabaw Creek, and Unnamed Tributary to Voorheis Lake	Water
040900030102-03	Includes: SASHABAW CREEK	Water
040900030103-01	Includes: Clinton River, Lake Angelus Creek, Mohawk Outlet, Silver Lake Outlet, Schoolhouse Lake Outlet, Unnamed Tributary to Eagle Lake, Unnamed Tributary to Lake Angelus, and Unnamed Tributary to Lotus Lake	Water
040900030104-01	Includes: Fish Lake Outlet, Paint Creek Drain, and Unnamed Tributaries to Paint Creek Drain	Water
040900030105-01	Includes: Paint Creek and Unnamed Tributaries to Paint Creek	Water
040900030106-01	Includes: Krohn Drain, Stony Creek, Unnamed Tributary to Lakeville Lake, Unnamed Tributary near Lakeville Lake, and Unnamed Tributary to Stony Creek	Water
040900030107-01	Includes: Unnamed Tributary to West Branch Stony Creek and West Branch Stony Creek	Water
040900030108-01	Includes: Clinton River	Water
040900030108-02	Includes: Clinton River, Geneva Lake Outlet, Pleasant Lake Outlet, Pontiac Creek, Unnamed Tributaries to Cass Lake, Unnamed Tributary to Geneva Lake, Unnamed Tributaries to Pontiac Lake, and Unnamed Tributaries to Sylvan Lake	Water
040900030109-01	Includes: Crooked Lake Outlet, Stony Creek, and Unnamed Tributary to Stony Creek	Water
040900030109-03	Includes: McClure Drain, Mount Vernon Drain, Stony Creek, and Unnamed Tributaries to Stony Creek	Water
040900030110-01	Includes: GALLAGHER CREEK	Water
040900030110-02	Includes: PAINT CREEK	Water
040900030111-01	Includes: Clinton River, Galloway Creek, Galloway Drain, Unnamed Tributaries to Clinton River, and Unnamed Tributaries to Galloway Creek	Water
040900030201-01	Includes: RED RUN DRAIN	Water
040900030201-03	Includes: PLUM BROOK	Water
040900030202-01	Includes: RED RUN DRAIN	Water
040900030203-01	Includes: RED RUN DRAIN	Water
040900030203-02	Includes: BIG BEAVER CREEK	Water
040900030204-01	Includes: Moore Drain and Unnamed Tributary to Plum Brook	Water
040900030204-02	Includes: Unnamed Tributary to Red Run	Water
040900030204-03	Includes: Plum Brook	Water

AUID	Water Body Name	Basis of PCB Impairment
040900030205-01	Includes: Bear Creek	Water
040900030205-02	Includes: Red Run	Water
040900030301-01	Includes: McKay Ditch, North Branch Clinton River, and Unnamed Tributaries to North Branch Clinton River	Water
040900030301-02	Includes: North Branch Clinton River and Unnamed Tributary to North Branch Clinton River	Water
040900030302-01	Includes: HIGHBANK CREEK	Water
040900030303-01	Includes: East Branch Coon Creek	Water
040900030303-02	Includes: East Branch Coon Creek, Hill Drain, Ray-Lenox Drain, Stark Drain, Unnamed Tributaries to East Branch Coon Creek, and Woodbeck Drain	Water
040900030304-01	Includes: Apel Drain, Farley Drain, Mahaffy Drain, Newland Drain, North Branch Clinton River, Townline Drain, Unnamed Tributary to Apel Drain, Unnamed Tributary to Mahaffy Drain, Unnamed Tributaries to Newland Drain, and Wilson Drain	Water
040900030305-01	Includes: East Pond Creek and Unnamed Tributaries to Secord Lake	Water
040900030305-02	Includes: East Pond Creek and Hidden Lake Outlet	Water
040900030306-01	Includes: Armada and Ray Drain, Coon Creek, Priest Drain, Tupper Brook, Unnamed Tributaries to Coon Creek, and Unnamed Tributary to Priest Drain	Water
040900030307-01	Includes: Middle Branch Clinton River and Unnamed Tributaries to Middle Branch Clinton River	Water
040900030307-02	Includes: Unnamed Tributaries to Yates Drain and Yates Drain	Water
040900030308-01	Includes: Healy Drain, Heide Drain, Miller Drain, Price Brook, Unnamed Tributaries to Healy Drain, and Unnamed Tributary to Price Brook	Water
040900030309-01	Includes: Bannister Drain, Crittenden Drain, Decker Drain, Dunn Drain, Harris Drain, Kenner Drain, Lewis Drain, Longstaff Drain, Longstaff Drain Number Two, Shoemaker Drain, Unnamed Tributary to Middle Branch Clinton River, and Utica Drain	Water
040900030310-01	Includes: North Branch Clinton River	Water
040900030310-02	Includes: North Branch Clinton River and Wyman Drain	Water
040900030310-03	Includes: DEER CREEK	Water
040900030310-04	Includes: North Branch Clinton River	Water
040900030310-05	Includes: CAMP BROOK DRAIN	Water
040900030311-01	Includes: Heydenreich Drain, Howard Drain, Middle Branch Clinton River, Miller Drain, Nicol Drain, Pingle Drain, Preston Drain, Unnamed Tributaries to Middle Branch Clinton River, and Zander Drain	Water
040900030312-01	Includes: Conklin Drain, Hammon Drain, Hart Drain, McBride Drain, North Branch Clinton River, Thoel Drain, Unnamed Tributary to Hart Drain, and Unnamed Tributary to McBride Drain	Water
040900030401-01	Includes: SWEENEY DRAIN AND HARRINGTON DRAIN	Water
040900050101-01	Includes: Big Lake, Huron River, and Unnamed Tributaries to Huron River	Water
040900050102-01	Includes: Haven Hill Lake Outlet, Huron River, Unnamed Tributaries to Brendel Lake ,Unnamed Tributary to Oxbow Lake, and Unnamed Tributaries to Huron River	Water
040900050102-09	Includes: Fox Lake Outlet, Hayes Creek, Huron River, and Straits Lakes Outlet	Water
040900050103-03	Includes: CONGDON DRAIN	Water
040900050103-04	Includes: NORTON CREEK	Water
040900050103-05	Includes: Unnamed Tributaries to Norton Creek	Water
040900050104-03	Includes: Pettibone Creek and Unnamed Tributary to Pettibone Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040900050105-05	Includes: Huron River, Pleasant Lake Outlet, Sherwood Lake Outlet, Teeple Lake Outlet, Unnamed Tributary to Commerce Lake, Unnamed Tributary to Lake Sherwood, Unnamed Tributaries to North Commerce Lake	Water
040900050105-08	Includes: Huron River from Hubbell Pond outlet downstream to the Kent Lake inlet to include General Motors Road site.	Water
040900050106-01	Includes: Huron River and Unnamed Tributaries to Kent Lake	Water
040900050106-05	Includes: Huron River upstream of Dawson Road and Unnamed Tributaries to Huron River	Water
040900050107-01	Includes: WOODRUFF CREEK	Water
040900050107-03	Includes: Mann Creek, Unnamed Tributary near Proving Ground, and Unnamed Tributary to Sloan Lake	Water
040900050108-01	Includes: Blackwood Drain, Davis Creek, Novi Lyon Drain, Unnamed Tributaries to Blackwood Drain, and Unnamed Tributaries to Novi Lynn Drain	Water
040900050108-02	Includes: DAVIS CREEK	Water
040900050109-01	Includes: Nichwagh Lake Outlet, Unnamed Tributary to Walker Drain, and Walker Drain	Water
040900050109-02	Includes: Unnamed Tributary Nichwagh Lake Outlet (Yerkes Drain)	Water
040900050110-01	Includes: Sandy Bottom Lake Outlet, Ten Mile Lake Outlet, Tobin Lake Outlet, Unnamed Tributary to Sandy Bottom Lake Outlet, Unnamed Tributary to Tobin Lake, and Unnamed Tributaries to Tobin Lake Outlet	Water
040900050110-02	Includes: Davis Creek, Lyon Lake Outlet, and Unnamed Tributary to Davis Creek	Water
040900050111-01	Includes: Maxfield Lake Outlet, South Ore Creek, Unnamed Tributary to Grubb Lake, and Unnamed Tributary South Ore Creek	Water
040900050111-05	Includes: SOUTH ORE CREEK	Water
040900050112-01	Includes: Huron River and Spring Mill Creek	Water
040900050112-02	Includes: Dibrova Lake Outlet, Huron River, Maltby Lake Outlet, and Ore Lake Outlet	Water
040900050201-01	Includes: Pleasant Lake Drain Tributary to Mill Creek	Water
040900050202-01	Wilkinson Drain at Old US-12	Water
040900050202-02	Includes: Letts Creek watershed tributary to the N. Fork Mill Creek.	Water
040900050203-01	Includes: Mill Creek, North Fork	Water
040900050204-01	Includes: Mill Creek and Unnamed Tributaries to Mill Creek	Water
040900050204-02	Includes: MILL CREEK	Water
040900050301-01	Includes: O Connor Creek, Unnamed Tributary to Horseshoe Lake, and Unnamed Tributary to O Connor Creek	Water
040900050301-03	Includes: Horseshoe Lake Drain from the Huron River confluence upstream to just upstream of the Northfield Township WWTP outfall.	Water
040900050301-05	Includes: Horseshoe Lake Drain from just upstream of the Northfield WWTP to the legal lake level weir Horseshoe Lake outlet.	Water
040900050302-01	Includes: ARMS CREEK	Water
040900050303-01	Includes: Honey Creek and Unnamed Tributary to Honey Creek	Water
040900050303-03	Includes: HONEY CREEK	Water
040900050304-01	Includes: Lowe Lake Drain, Portage Creek, Unnamed Tributaries to Lowe Lake, Unnamed Tributary near Morton Road, Unnamed Tributary to Nichols Lake, and Unnamed Tributary to Sharp Lake	Water
040900050304-02	Includes: PORTAGE CREEK	Water
040900050304-03	Includes: Portage Creek	Water

AUID	Water Body Name	Basis of PCB Impairment
040900050305-01	Includes: Portage Creek	Water
040900050305-02	Includes: PORTAGE CREEK	Water
040900050305-03	Includes: UNADILLA STOCKBRIDGE DRAIN	Water
040900050306-01	Includes: North Lake Outlet, South Lake Outlet, Unnamed Tributary to Bruin Lake, Unnamed Tributaries to South Lake, and Unnamed Tributary to Snyder Lake	Water
040900050306-02	Includes: PORTAGE River, Livermore Creek	Water
040900050307-01	Includes: Bass Lake Outlet, Cordley Lake Outlet, Hay Creek, Huron River, Unnamed Tributaries to East Crooked Lake, Unnamed Tributaries to Hay Creek, and Unnamed Tributaries to Huron River	Water
040900050307-02	Includes: Huron River	Water
040900050307-04	Includes: Bishop Lake Outlet, Chilson Creek, and Unnamed Tributary to Chilson Creek	Water
040900050307-05	Includes: Bass Lake Outlet, Hay Creek, Rush Lake Outlet, and Tioga Lake Outlet	Water
040900050309-02	Includes: Huron River	Water
040900050309-03	Includes: Huron River, Unnamed Tributary to Barton Pond, and Unnamed Tributaries to Huron River	Water
040900050309-04	Includes: Unnamed Tributaries to Bridgeway Lake and Green Oak Lake and Unnamed Tributary to Huron River	Water
040900050309-05	Includes: Honey Creek upstream from Huron River confluence to Wagner Road, including Unnamed Tributary to Honey Creek	Water
040900050309-06	Includes: Unnamed Tributary to Huron River	Water
040900050401-01	Includes: Nelson Drain, Unnamed Tributary to Nelson Drain, and Wagner Drain	Water
040900050401-02	Fleming Creek and tributaries	Water
040900050402-02	Includes: Travers Creek, tributary to Huron River	Water
040900050402-03	Includes: Unnamed Tributary to Huron River	Water
040900050402-04	Includes: Mallets Creek from Huron River confluence upstream to Brown Park Pond dam.	Water
040900050402-05	Includes: SWIFT RUN CREEK	Water
040900050402-06	Includes: Huron River and Mallets Creek headwaters, near Ann Arbor Saline Road, and tributary to the Huron River.	Water
040900050403-04	Includes: Huron River, Snidecar Drain, and Superior Number One Drain	Water
040900050404-01	Includes: WILLOW RUN DRAIN	Water
040900050404-04	Includes: Unnamed Tributaries to Belleville Lake and Unnamed Tributary near Rawsonville Road	Water
040900050405-01	Includes: Huron River, Bunton Drain, Griggs Drain, Head Drain, Hubbard Drain, Jewett Drain, Throop Number One Drain, Unnamed Tributaries to Griggs Drain, and Unnamed Tributaries to Throop Number One Drain	Water
040900050406-01	Includes: Adams Drain, Cass Drain, Groh Drain, Hand Drain, Hubert Drain, Morrison Drain, Odette Drain, Reiser Drain, Silver Creek, Smith Creek, Unnamed Tributaries to Morrison Drain, Unnamed Tributaries to Silver Creek, and Unnamed Tributaries to Smith Cr	Water
040900050406-02	Includes: Smith Creek, Reh Drain and Unnamed Tributaries to Smith Creek upstream of Van Horn Road.	Water
040900050406-03	Includes: Silver Creek from Woodruff Road upstream	Water
040900050407-01	Includes: WAGNER-PINK DRAIN	Water
040900050407-02	Includes: Huron River, Bancroft Noles Drain, Brook Drain, Hale Drain, Regan Drain, Vandecar Drain, Unnamed Tributary to Huron River, and Warner Drain	Water
040900050407-05	Includes: Baker and Green Drain, Port Creek, Unnamed Tributary to Port Creek, and Van Houtin Drain	Water

AUID	Water Body Name	Basis of PCB Impairment
041000060101-01	Includes: BEAN CREEK	Water
041000060102-01	Includes: FISK DRAIN AND KEMPTON DRAIN	Water
041000060102-02	Includes: BRANCH CREEK	Water
041000060102-03	Includes: BEAN CREEK	Water
041000060102-04	Includes: BEAN CREEK	Water
041000060103-01	Includes: BEAN CREEK	Water
041000060104-01	Includes: POSEY LAKE AND SEELEY DRAIN	Water
041000060105-01	Includes: PRATVILLE DRAIN	Water
041000060105-02	Includes: LIME CREEK	Water
041000060105-03	Includes: LIME CREEK	Water
041000060105-04	Includes: DURFEE CREEK (DURFEE LAKE OUTLET)	Water
041000060106-01	Includes: BEAN CREEK	Water
041000060106-02	Includes: BEAN CREEK	Water
041000060106-03	Includes: MEDINA DRAIN	Water