



PCB Concentrations in Pere Marquette River and Muskegon River Watersheds, 2002

Open-File Report 2004-1088

Prepared in cooperation with
Michigan Department of Environmental Quality

U.S. Department of the Interior
U.S. Geological Survey

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PCB Concentrations in Pere Marquette River and Muskegon River Watersheds, 2002

By Lisa R. Fogarty

Introduction

Polychlorinated biphenyl compounds (PCBs) are a class of 209 individual compounds (known as congeners) for which there are no known natural sources. PCBs are carcinogenic and bioaccumulative compounds. For over 40 years, PCBs were manufactured in the United States. The flame resistant property of PCBs made them ideal chemicals for use as flame-retardants, and as coolants and lubricants in transformers and other electrical equipment. PCBs were also used in heating coils, carbonless paper, degreasers, varnishes, lacquers, waterproofing material, and cereal boxes. In addition, they were frequently used in the manufacturing of plastics, adhesives, and paints.

During the manufacturing period of PCBs, these chemicals entered the environment through atmospheric release during manufacturing and burning of PCB products, leaks and spills, and improper disposal. Although PCB manufacturing was banned over 20 years ago, PCBs still enter the environment from hazardous waste sites, improper disposals of PCB-containing products, weathering of asphalt and other substances containing PCBs, burning of PCB containing products, leakage from old equipment, leaching from landfills, and release from contaminated sediments. PCBs do not readily break down in the environment, thus remain there for long periods of time. A small amount may remain dissolved in water but most adhere to organic particles and bottom sediments.

In sufficient concentrations, PCBs affect human, wildlife, and aquatic health. PCBs accumulate in fatty tissues of animals and fish and are passed on to those that eat them. PCBs are animal teratogens and potentially carcinogenic. They can cause death of animals, fish, and birds; death or low growth rate of plants; shortened lifespan; reproductive problems; and lower fertility. Women who are exposed to high levels of PCBs may have babies with slightly lower birth weights and transfer the PCBs through the breast milk, which may affect the immune system and motor development of the child. Rule 323.1057 (Toxic Substances) of the Part 4. Water Quality Standards gives procedure for calculating water-quality values to protect human, wildlife and aquatic life. For total PCB, the applicable Rule 57 water-quality value is the human cancer value ($HCV=0.26$ ng/L),

In 2002, U. S. Geological Survey (USGS) and Michigan Department of Environmental Quality (MDEQ) cooperatively planned and executed a monitoring program for PCBs in water and sediment from the Pere Marquette River and Muskegon River watersheds. The Pere Marquette and Muskegon River are in the west central part of Michigan's Lower Peninsula (fig. 1). The Pere Marquette River watershed is about 750

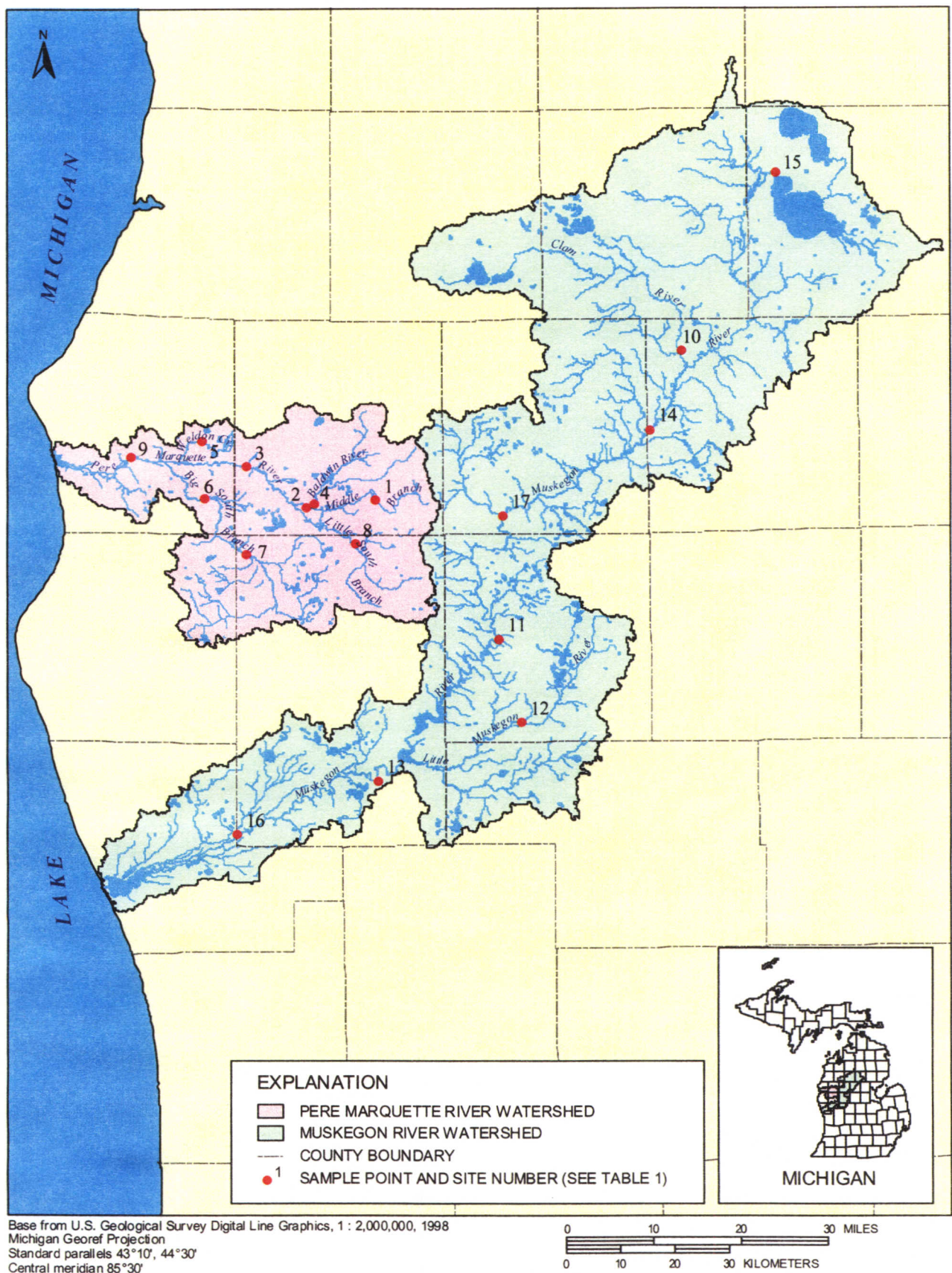


Figure 1. Location of sample-collection sites in the Pere Marquette River and Muskegon River watersheds, Michigan

square miles, and the Muskegon River is about 2700 square miles. Both rivers are popular recreational waters, and the Pere Marquette River is a Michigan designated Natural River (Part 305 of the Natural Rivers and Environmental Protection Act 451 of 1994).

Purpose and Scope

This report summarizes the PCB concentration data from water and sediment samples collected in 2002. Additional field and laboratory water-quality data from samples collected concurrently with the PCB samples also are presented.

Sample Collection and Analysis

Water samples were collected in April, May, June, August, and October at 17 locations, 9 in the Pere Marquette River watershed and 8 in the Muskegon River watershed (fig.1 and table 1). At most sites, four water samples were collected, in May, June, August, and October, 2002. At site 16, the furthest downstream site on the Muskegon River, 12 samples were collected from February through November, 2002. Additionally, sediment samples were collected from all 17 sites in August, 2002. Sites 9, 16, and 17 are also sample collection sites for MDEQ's long-term Water Chemistry Monitoring Project (WCMP).

Water and sediment samples were collected using MDEQ procedures or procedures described in *Lake Michigan Mass Balance Study Methods Compendium Volume 1: Sample Collection Techniques*, dated June 1997. Water samples were analyzed in the field for specific conductance, dissolved oxygen, pH, and temperature. Discharge was measured during sample collection at all sites that were not near or coincident with streamflow gages. At sites near streamflow gages, discharge was estimated.

Water samples were sent to the Wisconsin Laboratory of Hygiene for analysis of PCB congeners for all sites and for analysis of mercury at sites 9, 16, and 17. Water samples from the remaining 14 sites were sent to the MDEQ Laboratory for analysis of mercury. Water samples from all sites were sent to the MDEQ Laboratory for analysis of total nitrate, nitrite, Kjeldahl nitrogen, phosphorus, ortho-phosphate, sulfate, calcium, chloride, magnesium, organic carbon, sodium, potassium, sulfite, dissolved solids, suspended solids, hardness, specific conductance, pH, and turbidity.

Sediment samples were sent to the MDEQ Laboratory for analysis of PCB Aroclor 1016, 1232, 1242, 1248, 1254, 1260, 1262, 1268, and 1221; selected organic compounds; and the following metals: lead, zinc, chromium, cadmium, barium, selenium, mercury, arsenic, silver, and copper.

Results

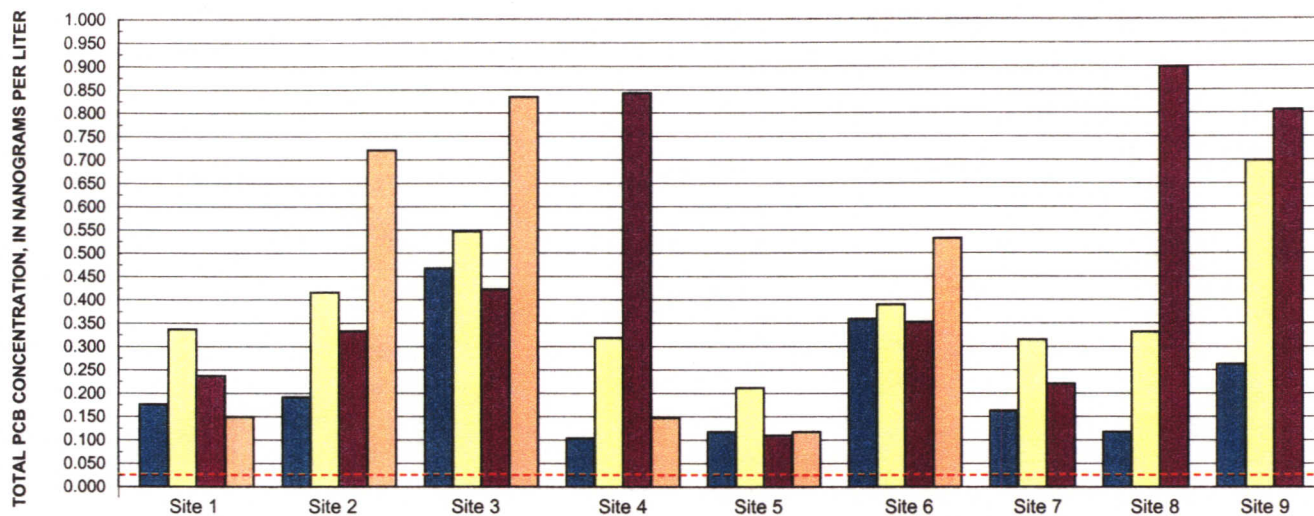
PCB concentrations

Each PCB congener has a Method Detection Limit (MDL) specific to the characteristics of the water sample. For instance, hardness affects the MDL. The analytical method, however, does measure an estimated concentration for congener concentrations below the MDL and greater than zero.

Table 1. Sample-collection sites in the Pere Marquette River and Muskegon River watersheds
[WCMP, Water Chemistry Monitoring Project]

Map Site Number	STORET ID	USGS Station No.	Waterbody	Watershed	County	Latitude	Longitude
1	430575	04122255	Middle Branch	Pere Marquette River	Lake	43.87303	-85.72398
2	430578	04122330	Main Branch	Pere Marquette River	Lake	43.86187	-85.88087
3	430591	04122390	Main Branch	Pere Marquette River	Lake	43.92916	-86.01910
4	430592	04122327	Baldwin River	Pere Marquette River	Lake	43.86838	-85.86206
5	530227	04122402	Weldon Creek	Pere Marquette River	Mason	43.97120	-86.12029
6	530235	04122450	Big South Branch	Pere Marquette River	Mason	43.87566	-86.11352
7	620248	04122435	Big South Branch	Pere Marquette River	Newaygo	43.78435	-86.01869
8	620249	04122280	Little South Branch	Pere Marquette River	Newaygo	43.80034	-85.77093
9	530027	04122500	Pere Marquette - WCMP overlap site	Pere Marquette River	Mason	43.94444	-86.28000
10	180128	04121310	Clam River	Muskegon River	Clare	44.11751	-85.01586
11	540034	04121650	Main Branch	Muskegon River	Mecosta	43.64191	-85.44202
12	540137	04121855	Little Muskegon	Muskegon River	Mecosta	43.50432	-85.39284
13	620250	04122000	Main Branch	Muskegon River	Newaygo	43.40706	-85.72099
14	670222	04121365	Main Branch	Muskegon River	Osceola	43.98603	-85.09009
15	720136	04120900	Main Branch	Muskegon River	Roscommon	44.40782	-84.79244
16	610273	04122030	Muskegon (Lower) - WCMP overlap site	Muskegon River	Muskegon	43.31777	-86.03888
17	670008	04121621	Muskegon (Upper) - WCMP overlap site	Muskegon River	Osceola	43.84722	-85.43231

Pere Marquette River Watershed



Muskegon River Watershed

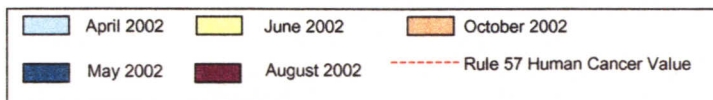
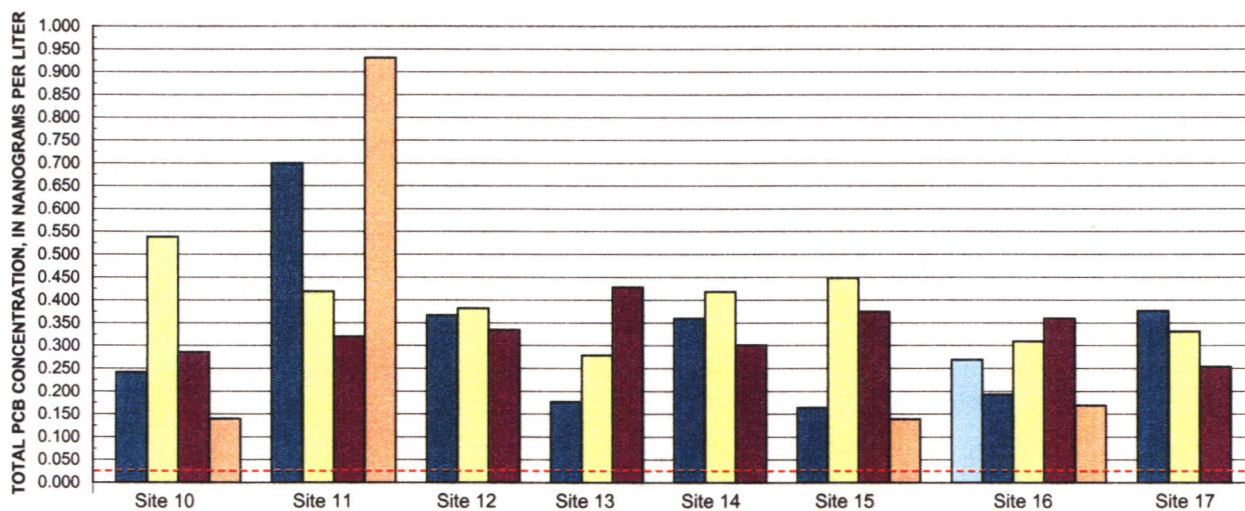


Figure 2. Total PCB concentrations for the Pere Marquette River and Muskegon River watersheds, 2002.

For the Pere Marquette River watershed, 33 samples were collected and analyzed for up to 75 congeners, for a total of 2,475 possible analyses (table 2). Analyses were not done, however, for a specific congener in 90 cases due to uncontrollable interference. Thus a total of 2,385 analyses were done. Of these, 967 had a concentration equal to zero and 1,418 were greater than zero. The MDL was exceeded in 62 samples; values were below the MDL in 1,356 samples.

For the Muskegon River watershed, 29 samples were collected and analyzed for up to 75 congeners, for a total of 2,175 possible analyses (table 3). Analyses were not done, however, for a specific congener in 73 cases due to uncontrollable interference. Thus a total of 2,102 analyses were done. Of these, 929 had a concentration equal to zero and 1,173 were greater than zero. The MDL was exceeded in 23 samples; values were below the MDL in 1,150 samples.

Total PCB concentration of a water sample was calculated as the sum of measured PCB congener concentrations for that sample. Total PCB concentrations for water samples from the Pere Marquette River watershed ranged from 0.103 to 0.898 ng/L (table 2). All samples exceed the Rule 57 human cancer value of 0.026 ng/L (fig. 2). Total PCB concentrations for water samples from the Muskegon River watershed ranged from 0.139 to 0.931 ng/L (table 3) and all samples exceed the Rule 57 human cancer value of 0.026 ng/L (fig. 2).

In the August 2002, sediment samples were collected at all 17 sites and analyzed for the PCB Aroclors identified previously. All of these PCB Aroclors were below analytical quantification in all sediment samples analyzed.

Additional water-quality data

Laboratory and field water-quality data for Pere Marquette River watershed and Muskegon River watershed, except for mercury, are presented in appendixes B and C, respectively. Mercury data are presented in appendix D.

Trace metal data for sediment samples are presented in appendix E. Only two organic chemicals were detected in sediment samples. At site 9 (STORET ID 530027), indeon (1, 2, 3-cd) pyrene was detected at a concentration of 620 µg/kg dry weight, and, at site 5 (STORET ID #530227), fluoranthene was detected at a concentration of 240 µg/kg dry weight.

Streamflow data

Mean daily discharge during 2002 for streamflow gages on the Pere Marquette River at Scottville and the Muskegon River at Evart are shown in figures 3 and 4. The discharge for October through December 2002 is provisional. Also shown on figures 3 and 4 are the mean of the daily mean discharges for the period of record for each streamflow gage. Comparison of the 2002 discharges to the long-term mean shows that streamflow was near normal from January through August and below normal the remainder of the year.

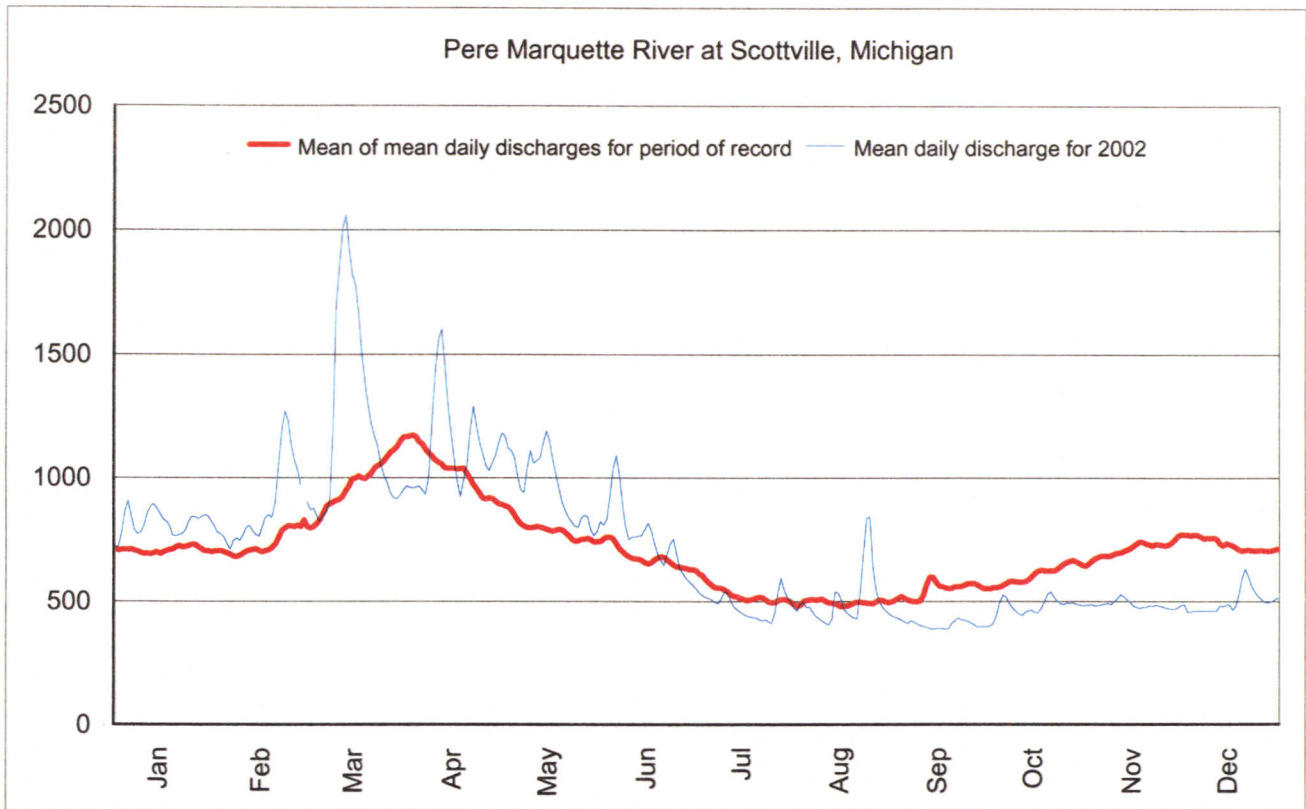


Figure 3. Mean daily discharge for the Pere Marquette River at Scottville, Michigan, 2002.

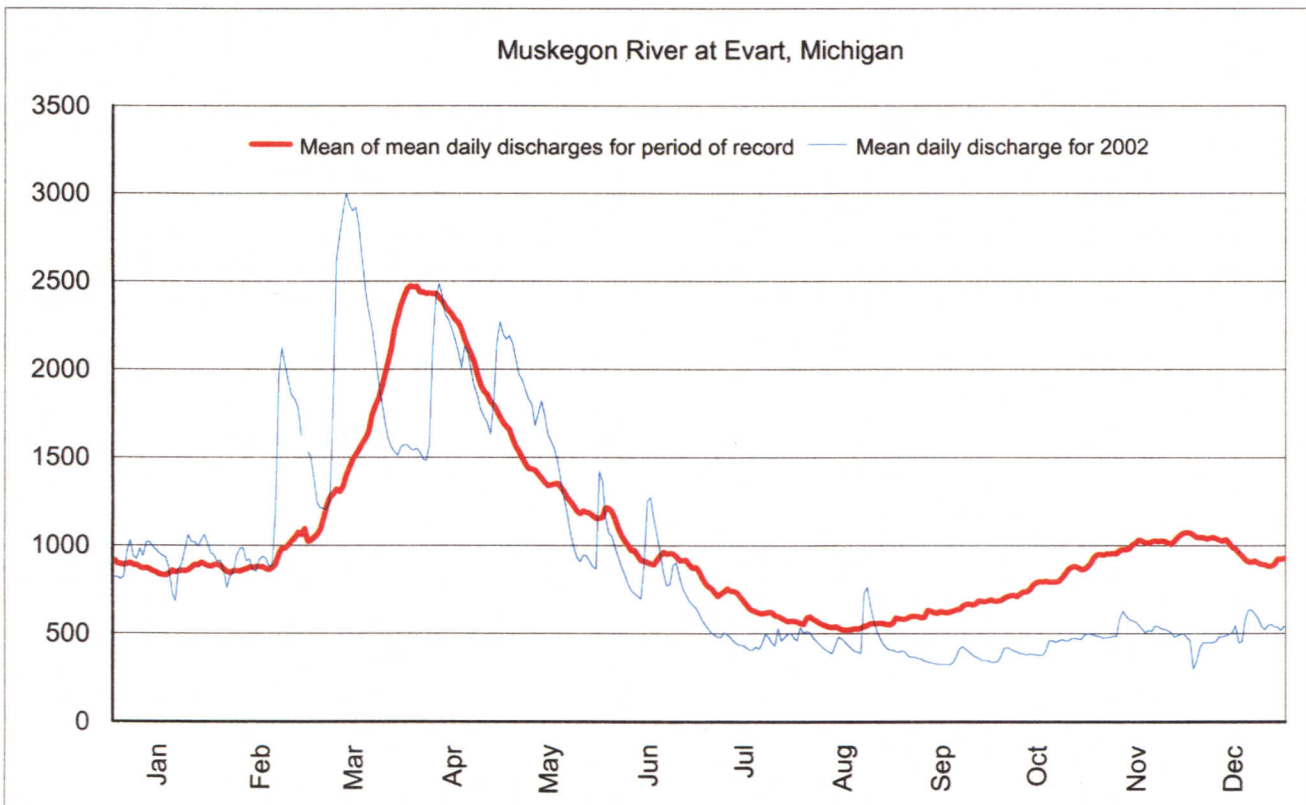


Figure 4. Mean daily discharge for the Muskegon River at Evart, Michigan, 2002.

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

					PCB Congeners (ng/L)									
Map Site		USGS	Sample	Calculated										
Number	STORET ID	Station No.	Collection Date	Total PCB ^a (ng/L)	101	118	123/149	128	132/153/105	135/144	136	137/176	141	146
Method Detection Level (MDL)					0.0055	0.0080	0.0050	0.0045	0.0100	0.0065	0.0150	0.0065	0.0040	0.0055
1	430575	04122255	5/14/2002	0.177	0.003 ^b	0.002 ^b	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.000	0.000	NAI
1	430575	04122255	6/25/2002	0.337	NAI	0.003 ^b	0.002 ^b	0.001 ^b	0.005 ^b	0.002 ^b	0.000	0.000	0.002 ^b	NAI
1	430575	04122255	8/6/2002	0.237	0.007 ^b	0.001 ^b	0.002 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.001 ^b	NAI
1	430575	04122255	10/8/2002	0.150	0.005 ^b	0.000	0.003 ^b	0.000	0.001 ^b	0.000	0.000	0.000	0.000	NAI
2	430578	04122330	5/15/2002	0.191	0.004 ^b	0.006 ^b	0.004 ^b	0.002 ^b	0.013	0.002 ^b	0.000	0.000	0.001 ^b	0.005 ^b
2	430578	04122330	6/25/2002	0.416	NAI	0.009	0.006	0.002 ^b	0.022	0.003 ^b	0.000	0.000	0.002 ^b	0.008
2	430578	04122330	8/6/2002	0.333	0.007	0.006 ^b	0.003 ^b	0.001 ^b	0.010 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.006 ^b
2	430578	04122330	10/8/2002	0.721	0.027	0.018	0.011	0.007	0.038	0.004 ^b	0.000	0.000	0.003 ^b	NAI
3	430591	04122390	5/15/2002	0.467	0.017	0.013	0.008	0.005	0.030	0.003 ^b	0.000	0.000	0.003 ^b	0.011
3	430591	04122390	6/26/2002	0.546	0.010	0.016	0.009	0.006	0.035	0.003 ^b	0.000	0.000	0.003 ^b	0.011
3	430591	04122390	8/7/2002	0.422	0.011	0.009	0.006	0.002 ^b	0.020	0.002 ^b	0.000	0.000	0.002 ^b	0.006 ^b
3	430591	04122390	10/9/2002	0.835	0.032	0.025	0.015	0.010	0.053	0.006 ^b	0.000	0.000	0.005	0.017
4	430592	04122327	5/14/2002	0.103	0.003 ^b	0.001 ^b	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.000	0.000	0.000
4	430592	04122327	6/25/2002	0.318	0.004 ^b	0.005 ^b	0.003 ^b	0.000	0.009 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.003 ^b
4	430592	04122327	8/6/2002	0.843	0.020	0.003 ^b	0.003 ^b	0.000	0.008 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.003 ^b
4	430592	04122327	10/8/2002	0.148	0.005 ^b	0.003 ^b	0.002 ^b	0.001 ^b	0.008 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.003 ^b
5	530227	04122402	5/15/2002	0.117	0.002 ^b	0.001 ^b	0.001 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.000 ^b	0.002 ^b
5	530227	04122402	6/26/2002	0.211	0.000	0.001 ^b	0.001 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.001 ^b	0.002 ^b
5	530227	04122402	8/7/2002	0.110	0.003 ^b	0.000	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.000	0.000	0.000
5	530227	04122402	10/9/2002	0.117	0.002 ^b	0.002 ^b	0.001 ^b	0.000	0.004 ^b	0.000	0.000	0.000	0.001 ^b	0.000
6	530235	04122450	5/16/2002	0.359	0.009	0.005 ^b	0.003 ^b	0.002 ^b	0.012	0.002 ^b	0.000	0.000	0.001 ^b	0.006
6	530235	04122450	6/27/2002	0.390	0.007 ^b	0.007 ^b	0.004 ^b	0.002 ^b	0.014	0.001 ^b	0.000	0.000	0.001 ^b	0.005 ^b
6	530235	04122450	8/7/2002	0.352	0.007 ^b	0.002 ^b	0.002 ^b	0.001 ^b	0.002 ^b	0.000	0.000	0.000	0.000	NAI
6	530235	04122450	10/9/2002	0.532	0.020	0.011	0.007	0.005 ^b	0.029	0.004 ^b	0.000	0.000	0.003 ^b	0.009
7	620248	04122435	5/15/2002	0.163	0.003 ^b	0.001 ^b	0.001 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.000	0.000
7	620248	04122435	6/26/2002	0.315	0.004 ^b	0.003 ^b	0.002 ^b	0.001 ^b	0.006 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.002 ^b
7	620248	04122435	8/7/2002	0.220	0.004 ^b	0.001 ^b	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.000	0.000	0.000
8	620249	04122280	5/14/2002	0.118	0.003 ^b	0.000	0.000 ^b	0.000	0.001 ^b	0.001 ^b	0.000	0.000	0.000	0.001 ^b
8	620249	04122280	6/25/2002	0.332	0.000	0.004 ^b	0.002 ^b	0.000	0.008 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.002 ^b
8	620249	04122280	8/6/2002	0.898	0.018	0.004 ^b	0.003 ^b	0.001 ^b	0.008 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.003 ^b
9	530027	04122500	5/15/2002	0.262	0.009	0.007 ^b	0.005 ^b	0.003 ^b	0.015	0.002 ^b	0.000	0.000	0.002 ^b	0.007
9	530027	04122500	6/26/2002	0.699	0.030	0.037	0.019	0.009	0.066	0.006 ^b	0.000	0.000	0.006	0.019
9	530027	04122500	8/7/2002	0.806	0.033	0.031	0.018	0.007	0.063	0.006 ^b	0.000	0.000	0.005	0.017

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	PCB Congeners (ng/L)										
				15/17	151	158	16/32	163/138	167	170/190	172	174	177	178
Method Detection Level (MDL)				0.0150	0.0050	0.0075	0.0110	0.0110	0.0060	0.0055	0.0075	0.0055	0.0060	0.0070
1	430575	04122255	5/14/2002	0.011 ^b	0.000	0.000	0.010 ^b	0.000	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
1	430575	04122255	6/25/2002	0.023	0.001 ^b	0.000	0.024	0.000	0.000	0.003 ^b	0.000	0.002 ^b	0.001 ^b	0.000
1	430575	04122255	8/6/2002	0.013 ^b	0.000	0.000	0.013 ^b	0.000	0.000	0.000	0.000	0.001 ^b	0.000	0.000
1	430575	04122255	10/8/2002	0.012 ^b	0.000	0.000	0.011 ^b	0.003 ^b	0.000	0.000	0.000	0.000	0.000	0.000
2	430578	04122330	5/15/2002	0.007 ^b	0.001 ^b	0.001 ^b	0.008 ^b	0.015	0.000	0.002 ^b	0.000	0.002 ^b	0.001 ^b	0.000
2	430578	04122330	6/25/2002	0.020	0.001 ^b	0.002 ^b	0.017	0.025	0.001 ^b	0.004 ^b	0.001 ^b	0.003 ^b	0.003 ^b	0.002 ^b
2	430578	04122330	8/6/2002	0.014 ^b	0.000	0.000	0.014	0.013	0.000	0.002 ^b	0.000	0.002 ^b	0.001 ^b	0.000
2	430578	04122330	10/8/2002	0.017 ^b	0.004 ^b	0.004 ^b	0.015 ^b	0.046	0.001 ^b	0.007	0.004 ^b	0.005 ^b	0.006 ^b	0.003 ^b
3	430591	04122390	5/15/2002	0.011 ^b	0.002 ^b	0.002 ^b	0.013 ^b	0.035	0.000	0.006 ^b	0.003 ^b	0.003 ^b	0.004 ^b	0.003 ^b
3	430591	04122390	6/26/2002	0.015 ^b	0.003 ^b	0.003 ^b	0.015	0.041	0.001 ^b	0.007	0.003 ^b	0.004 ^b	0.005 ^b	0.003 ^b
3	430591	04122390	8/7/2002	0.015 ^b	0.002 ^b	0.002 ^b	0.011 ^b	0.022	0.000	0.003 ^b	0.001 ^b	0.002 ^b	0.002 ^b	0.002 ^b
3	430591	04122390	10/9/2002	0.013 ^b	0.006	0.004 ^b	0.011 ^b	0.062	0.002 ^b	0.010	0.005 ^b	0.007	0.008	0.005 ^b
4	430592	04122327	5/14/2002	0.007 ^b	0.000	0.000	0.008 ^b	0.005 ^b	0.000	0.000	0.000	0.000	0.000	0.000
4	430592	04122327	6/25/2002	0.018	0.001 ^b	0.000	0.021	0.012	0.000	0.002 ^b	0.000	0.001 ^b	0.000	0.000
4	430592	04122327	8/6/2002	0.053	0.002 ^b	0.000	0.046	0.008 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
4	430592	04122327	10/8/2002	0.000	0.001 ^b	0.000	0.000	0.008 ^b	0.000	0.001 ^b	0.001 ^b	0.001 ^b	0.001 ^b	0.000
5	530227	04122402	5/15/2002	0.010 ^b	0.000	0.000	0.009 ^b	0.003 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
5	530227	04122402	6/26/2002	0.020	0.000	0.000	0.019	0.003 ^b	0.000	0.000	0.000	0.000	0.000	0.000
5	530227	04122402	8/7/2002	NAI	0.000	0.000	NAI	0.003 ^b	0.000	0.000	0.000	0.001 ^b	0.000	0.000
5	530227	04122402	10/9/2002	0.009 ^b	0.000	0.000	NAI	0.005 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
6	530235	04122450	5/16/2002	0.014 ^b	0.001 ^b	0.000	0.013 ^b	0.014	0.000	0.002 ^b	0.000	0.002 ^b	0.002 ^b	0.001 ^b
6	530235	04122450	6/27/2002	0.014 ^b	0.001 ^b	0.000	0.016	0.017	0.000	0.002 ^b	0.000	0.002 ^b	0.000	0.001 ^b
6	530235	04122450	8/7/2002	0.022 ^b	0.000	0.000	0.018 ^b	0.000	0.000	0.001 ^b	0.000	0.000	0.000	0.000
6	530235	04122450	10/9/2002	0.014 ^b	0.003 ^b	0.002 ^b	0.011 ^b	0.033	0.000	0.006 ^b	0.003 ^b	0.004 ^b	0.004 ^b	0.002 ^b
7	620248	04122435	5/15/2002	0.013 ^b	0.000	0.000	0.012 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.000	0.000
7	620248	04122435	6/26/2002	0.030	0.000	0.000	0.022	0.008 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
7	620248	04122435	8/7/2002	0.018 ^b	0.000	0.000	0.015 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.000	0.000
8	620249	04122280	5/14/2002	0.015 ^b	0.000	0.000	0.017	0.002 ^b	0.000	0.000	0.000	0.000	0.000	0.000
8	620249	04122280	6/25/2002	0.018 ^b	0.000	0.000	0.019	0.010 ^b	0.000	0.002 ^b	0.000	0.001 ^b	0.000	0.000
8	620249	04122280	8/6/2002	0.059	0.002 ^b	0.001 ^b	0.055	0.008 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
9	530027	04122500	5/15/2002	0.009 ^b	0.002 ^b	0.001 ^b	0.009 ^b	0.018	0.000	0.002 ^b	0.000	0.002 ^b	0.002 ^b	0.001 ^b
9	530027	04122500	6/26/2002	0.012 ^b	0.005	0.006 ^b	NAI	0.076	0.003 ^b	0.012	0.006 ^b	0.008	0.009	0.006 ^b
9	530027	04122500	8/7/2002	0.017 ^b	0.004 ^b	0.007 ^b	NAI	0.068	0.003 ^b	0.011	0.005 ^b	0.008	0.009	0.005 ^b

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)										
Map Site	USGS Station	Sample												
Number	STORET ID	No.	Collection Date	18	180	183	185	187/182	19	193	194	198	199	201
Method Detection Level (MDL)				0.0070	0.0065	0.0055	0.0035	0.0050	0.0035	0.0075	0.0055	0.0075	0.0045	0.0090
1	430575	04122255	5/14/2002	0.007 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.000	0.001 ^b
1	430575	04122255	6/25/2002	0.012	0.004 ^b	0.001 ^b	0.000	0.002 ^b	0.029	0.000	0.003 ^b	0.000	0.000	0.003 ^b
1	430575	04122255	8/6/2002	0.008 ^b	0.000	0.000	0.000	0.001 ^b	0.007	0.000	0.000	0.000	0.000	0.000
1	430575	04122255	10/8/2002	0.004 ^b	0.000	0.000	0.000	0.001 ^b	0.006	0.000	0.000	0.000	0.000	0.000
2	430578	04122330	5/15/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.001 ^b	0.000	0.000	0.002 ^b
2	430578	04122330	6/25/2002	0.008 ^b	0.006 ^b	0.003 ^b	0.000	0.005	0.026	0.000	0.002 ^b	0.000	0.000	0.004 ^b
2	430578	04122330	8/6/2002	0.010	0.004 ^b	0.001 ^b	0.000	0.003 ^b	0.004 ^b	0.000	0.002 ^b	0.000	0.000	0.002 ^b
2	430578	04122330	10/8/2002	0.009 ^b	0.013	0.005 ^b	0.000	0.010	0.009	0.001 ^b	0.004 ^b	0.000	0.000	0.006 ^b
3	430591	04122390	5/15/2002	0.004 ^b	0.010	0.003 ^b	0.000	0.008	0.007	0.000	0.002 ^b	0.000	0.000	0.005 ^b
3	430591	04122390	6/26/2002	0.009	0.011	0.004 ^b	0.000	0.009	0.007	0.001 ^b	0.003 ^b	0.000	0.000	0.007 ^b
3	430591	04122390	8/7/2002	0.008 ^b	0.006 ^b	0.002 ^b	0.000	0.005 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.003 ^b
3	430591	04122390	10/9/2002	0.006 ^b	0.018	0.006	0.001 ^b	0.014	0.009	0.002 ^b	0.005 ^b	0.000	0.000	0.010
4	430592	04122327	5/14/2002	0.002 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.005 ^b	0.000	0.000	0.000	0.000	0.000
4	430592	04122327	6/25/2002	0.009	0.002 ^b	0.000	0.000	0.002 ^b	0.005	0.000	0.001 ^b	0.000	0.000	0.002 ^b
4	430592	04122327	8/6/2002	0.028	0.003 ^b	0.001 ^b	0.000	0.002 ^b	NAI	0.000	0.001 ^b	0.000	0.000	0.001 ^b
4	430592	04122327	10/8/2002	0.003 ^b	0.002 ^b	0.001 ^b	0.000	0.002 ^b	0.004	0.000	0.001 ^b	0.000	0.000	0.001 ^b
5	530227	04122402	5/15/2002	0.002 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.006	0.000	0.000	0.000	0.000	0.000
5	530227	04122402	6/26/2002	0.008 ^b	0.000	0.000	0.000	0.001 ^b	0.013	0.000	0.000	0.000	0.000	0.000
5	530227	04122402	8/7/2002	0.008	0.000	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	0.000	0.000	0.000
5	530227	04122402	10/9/2002	0.003 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.007	0.000	0.001 ^b	0.000	0.000	0.001 ^b
6	530235	04122450	5/16/2002	0.005 ^b	0.004 ^b	0.001 ^b	0.000	0.003 ^b	0.008	0.000	0.002 ^b	0.000	0.000	0.002 ^b
6	530235	04122450	6/27/2002	0.008 ^b	0.004 ^b	0.001 ^b	0.000	0.003 ^b	0.008	0.000	0.002 ^b	0.000	0.000	0.003 ^b
6	530235	04122450	8/7/2002	0.009 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.008	0.000	0.000	0.000	0.000	0.000
6	530235	04122450	10/9/2002	0.005 ^b	0.010	0.003 ^b	0.000	0.008	0.008	0.000	0.002 ^b	0.000	0.000	0.005 ^b
7	620248	04122435	5/15/2002	0.004 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.007	0.000	0.000	0.000	0.000	0.000
7	620248	04122435	6/26/2002	0.013	0.001 ^b	0.001 ^b	0.000	0.001 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.002 ^b
7	620248	04122435	8/7/2002	0.008 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	0.000	0.000	0.000
8	620249	04122280	5/14/2002	0.004 ^b	0.001 ^b	0.000	0.000	0.000 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.000
8	620249	04122280	6/25/2002	0.016	0.002 ^b	0.001 ^b	0.000	0.002 ^b	0.012	0.000	0.001 ^b	0.000	0.000	0.002 ^b
8	620249	04122280	8/6/2002	0.033	0.003 ^b	0.000	0.000	0.002 ^b	0.009	0.000	0.001 ^b	0.000	0.000	0.000
9	530027	04122500	5/15/2002	0.005 ^b	0.004 ^b	0.002 ^b	0.000	0.004 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.003 ^b
9	530027	04122500	6/26/2002	0.006 ^b	0.022	0.007	0.001 ^b	0.016	0.004 ^b	0.002 ^b	0.005	0.000	0.000	0.013
9	530027	04122500	8/7/2002	0.008 ^b	0.022	0.007	0.000	0.016	0.009	0.002 ^b	0.005 ^b	0.000	0.000	0.013

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	PCB Congeners (ng/L)										
				202/171	203/196	206	207	208/195	22	24/27	25	26	28/31	3
Method Detection Level (MDL)				0.0040	0.0140	0.0035	0.0035	0.0040	0.0110	0.0035	0.0060	0.0070	0.0200	0.2200
1	430575	04122255	5/14/2002	0.000	0.000	0.000	0.000	0.000	0.016 ^b	0.000	0.000	0.000	0.012 ^b	0.000
1	430575	04122255	6/25/2002	0.000	0.005 ^b	0.001 ^b	0.000	0.001 ^b	0.021	0.000	0.000	0.000	0.033	0.000
1	430575	04122255	8/6/2002	0.000	0.000	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.017 ^b	0.000
1	430575	04122255	10/8/2002	0.000	0.000	0.000	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.007 ^b	0.000
2	430578	04122330	5/15/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.001 ^b	0.013 ^b	0.000	0.000	0.000	0.010 ^b	0.000
2	430578	04122330	6/25/2002	0.002 ^b	0.005 ^b	0.001 ^b	0.000	0.001 ^b	0.018	0.000	0.000	0.000	0.017 ^b	0.000
2	430578	04122330	8/6/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.001 ^b	0.007 ^b	0.000	0.000	0.000	0.017 ^b	0.000
2	430578	04122330	10/8/2002	0.003 ^b	0.009 ^b	0.002 ^b	0.000	0.002 ^b	0.010 ^b	0.000	0.000	0.000	0.031	0.000
3	430591	04122390	5/15/2002	0.002 ^b	0.006 ^b	0.001 ^b	0.000	0.001 ^b	0.000	0.000	0.000	0.000	0.019 ^b	0.000
3	430591	04122390	6/26/2002	0.002 ^b	0.008 ^b	0.002 ^b	0.000	0.002 ^b	0.013 ^b	0.000	0.000	0.000	0.016 ^b	0.000
3	430591	04122390	8/7/2002	0.001 ^b	0.004 ^b	0.001 ^b	0.000	0.001 ^b	0.011 ^b	0.000	0.000	0.000	0.017 ^b	0.000
3	430591	04122390	10/9/2002	0.004 ^b	0.011 ^b	0.003 ^b	0.000	0.002 ^b	0.008 ^b	0.000	0.002 ^b	0.002 ^b	0.027 ^b	0.000
4	430592	04122327	5/14/2002	0.000	0.000	0.001 ^b	0.000	0.000	0.000	0.000	0.000	0.000	0.008 ^b	0.000
4	430592	04122327	6/25/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.001 ^b	0.023	0.000	0.000	0.000	0.014 ^b	0.000
4	430592	04122327	8/6/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.000	0.030	0.003 ^b	0.004 ^b	0.005 ^b	0.090	0.000
4	430592	04122327	10/8/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.000	0.007 ^b	0.000	0.000	0.000	0.008 ^b	0.000
5	530227	04122402	5/15/2002	0.000	0.000	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.013 ^b	0.000
5	530227	04122402	6/26/2002	0.000	0.000	0.000	0.000	0.000	0.009 ^b	0.001 ^b	0.000	0.000	0.021 ^b	0.000
5	530227	04122402	8/7/2002	0.000	0.000	0.000	0.000	0.000	0.007 ^b	0.000	0.001 ^b	0.002 ^b	0.000	0.000
5	530227	04122402	10/9/2002	0.000	0.002 ^b	0.001 ^b	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
6	530235	04122450	5/16/2002	0.001 ^b	0.004 ^b	0.001 ^b	0.000	0.002 ^b	0.009 ^b	0.000	0.000	0.000	0.017 ^b	0.000
6	530235	04122450	6/27/2002	0.001 ^b	0.004 ^b	0.001 ^b	0.000	0.001 ^b	0.011 ^b	0.000	0.000	0.000	0.009 ^b	0.000
6	530235	04122450	8/7/2002	0.000	0.000	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.025 ^b	0.000
6	530235	04122450	10/9/2002	0.002 ^b	0.006 ^b	0.001 ^b	0.000	0.001 ^b	0.005 ^b	0.001 ^b	0.000	0.000	0.019 ^b	0.000
7	620248	04122435	5/15/2002	0.000	0.000	0.000	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.015 ^b	0.000
7	620248	04122435	6/26/2002	0.000	0.000	0.000	0.000	0.000	0.011 ^b	0.002 ^b	0.001 ^b	0.000	0.034	0.000
7	620248	04122435	8/7/2002	0.000	0.000	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.023 ^b	0.000
8	620249	04122280	5/14/2002	0.000	0.000	0.000	0.000	0.000	NAI	0.000	0.000	0.000	NAI	0.000
8	620249	04122280	6/25/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.001 ^b	0.033	0.000	0.000	0.000	0.023 ^b	0.000
8	620249	04122280	8/6/2002	0.001 ^b	0.000	0.000	0.000	0.000	0.024	0.004 ^b	0.005 ^b	0.009 ^b	0.084	0.000
9	530027	04122500	5/15/2002	0.001 ^b	0.000	0.001 ^b	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.015 ^b	0.000
9	530027	04122500	6/26/2002	0.004	0.014 ^b	0.004	0.000	0.003 ^b	NAI	0.002 ^b	0.002 ^b	0.000	NAI	0.000
9	530027	04122500	8/7/2002	0.004 ^b	0.013 ^b	0.003 ^b	0.000	0.003 ^b	0.020	0.002 ^b	0.000	0.000	0.017 ^b	0.000

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	PCB Congeners (ng/L)										
				33	37/42	4/10	40	41/71/64	44	45	46	47/48	49	51
Method Detection Level (MDL)				0.0075	0.0100	0.0250	0.0050	0.0100	0.0065	0.0045	0.0045	0.0090	0.0050	0.0035
1	430575	04122255	5/14/2002	0.003 ^b	NAI	0.000	0.000	0.004 ^b	0.005 ^b	0.002 ^b	0.003 ^b	0.012 ^b	0.005 ^b	0.010
1	430575	04122255	6/25/2002	0.000	NAI	0.030 ^b	NAI	0.014	0.008 ^b	0.004 ^b	0.004 ^b	0.000	0.012	0.005
1	430575	04122255	8/6/2002	0.000	0.000	0.000	0.000	0.004 ^b	0.000	0.002 ^b	0.002 ^b	0.009 ^b	0.006 ^b	0.005 ^b
1	430575	04122255	10/8/2002	0.004 ^b	NAI	0.019 ^b	0.000	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.005 ^b	0.007
2	430578	04122330	5/15/2002	0.002 ^b	0.005 ^b	0.000	NAI	0.005 ^b	0.003 ^b	0.000	0.000	0.006 ^b	0.005 ^b	0.004 ^b
2	430578	04122330	6/25/2002	0.000	0.012 ^b	0.028 ^b	NAI	0.010 ^b	0.005 ^b	0.003 ^b	0.005 ^b	0.010 ^b	0.008	0.008
2	430578	04122330	8/6/2002	0.004 ^b	0.009 ^b	0.025 ^b	NAI	0.004 ^b	0.006 ^b	0.000	0.000	0.008 ^b	0.005 ^b	0.006
2	430578	04122330	10/8/2002	0.007 ^b	NAI	0.026 ^b	NAI	0.012 ^b	0.012	0.004 ^b	0.000	0.017	0.014	0.006
3	430591	04122390	5/15/2002	0.000	0.000	0.000	NAI	0.004 ^b	0.006 ^b	0.002 ^b	0.000	0.009 ^b	0.009	0.004 ^b
3	430591	04122390	6/26/2002	0.004 ^b	0.009 ^b	0.030	NAI	0.005 ^b	0.006 ^b	0.002 ^b	0.004 ^b	0.000	0.005 ^b	0.006
3	430591	04122390	8/7/2002	0.007 ^b	0.010 ^b	0.027 ^b	NAI	0.006 ^b	0.006 ^b	0.003 ^b	0.000	0.011	0.006	0.006
3	430591	04122390	10/9/2002	0.005 ^b	NAI	0.022 ^b	NAI	0.013 ^b	0.012	0.002 ^b	0.000	0.016	0.016	0.006
4	430592	04122327	5/14/2002	0.000	0.000	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.006 ^b	NAI	0.000
4	430592	04122327	6/25/2002	0.007 ^b	NAI	0.012 ^b	NAI	0.007 ^b	0.009	0.000	0.000	0.009 ^b	0.007	0.007
4	430592	04122327	8/6/2002	0.026	0.020	0.020 ^b	NAI	0.016	0.025	0.003 ^b	0.002 ^b	0.032	0.018	0.005
4	430592	04122327	10/8/2002	0.004 ^b	NAI	0.000	NAI	0.005 ^b	0.005 ^b	0.000	0.000	0.012	0.004 ^b	0.003 ^b
5	530227	04122402	5/15/2002	0.002 ^b	0.003 ^b	0.000	0.000	0.004 ^b	0.004 ^b	0.000	0.000	0.007 ^b	0.005 ^b	0.005
5	530227	04122402	6/26/2002	0.000	0.004 ^b	0.016 ^b	NAI	0.006 ^b	0.006 ^b	0.001 ^b	0.001 ^b	0.011	0.007	0.005
5	530227	04122402	8/7/2002	0.006 ^b	0.006 ^b	0.000	0.000	0.005 ^b	0.006 ^b	0.000	0.000	0.007 ^b	0.006	0.002 ^b
5	530227	04122402	10/9/2002	NAI	NAI	0.013 ^b	NAI	0.005 ^b	0.015	0.000	0.000	0.004 ^b	NAI	NAI
6	530235	04122450	5/16/2002	0.004 ^b	0.000	0.021 ^b	NAI	0.005 ^b	0.005 ^b	0.003 ^b	0.003 ^b	0.006 ^b	0.006 ^b	0.002 ^b
6	530235	04122450	6/27/2002	0.005 ^b	0.009 ^b	0.037	NAI	0.004 ^b	0.006 ^b	0.000	0.000	0.006 ^b	0.004 ^b	0.003 ^b
6	530235	04122450	8/7/2002	0.004 ^b	NAI	0.030 ^b	0.000	0.004 ^b	0.000	0.003 ^b	0.000	0.015 ^b	0.010	0.007
6	530235	04122450	10/9/2002	0.004 ^b	NAI	0.000	NAI	0.008 ^b	0.009 ^b	0.003 ^b	0.000	0.015	0.011	0.004 ^b
7	620248	04122435	5/15/2002	0.004 ^b	0.006 ^b	0.000	NAI	0.003 ^b	0.005 ^b	0.002 ^b	0.000	0.016	0.005 ^b	0.009
7	620248	04122435	6/26/2002	0.000	0.008 ^b	0.013 ^b	NAI	0.009 ^b	0.011	0.002 ^b	0.003 ^b	0.018	0.012	0.007
7	620248	04122435	8/7/2002	0.004 ^b	0.006 ^b	0.000	0.000	0.006 ^b	0.007 ^b	0.002 ^b	0.000	0.011 ^b	0.007	0.003 ^b
8	620249	04122280	5/14/2002	0.003 ^b	0.000	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.006 ^b	0.008	NAI
8	620249	04122280	6/25/2002	0.000	0.013	0.000	NAI	0.009 ^b	0.006 ^b	0.002 ^b	0.000	0.011	0.006	0.008
8	620249	04122280	8/6/2002	0.018	0.019	0.032 ^b	NAI	0.023	0.033	0.006 ^b	0.003 ^b	0.039	0.027	0.009
9	530027	04122500	5/15/2002	0.003 ^b	0.000	0.000	NAI	0.006 ^b	0.006 ^b	0.001 ^b	0.000	0.009 ^b	0.006 ^b	0.006
9	530027	04122500	6/26/2002	NAI	NAI	0.019 ^b	NAI	0.008 ^b	0.013	0.000	0.000	0.005 ^b	0.005 ^b	NAI
9	530027	04122500	8/7/2002	0.000	0.008 ^b	0.032 ^b	NAI	0.008 ^b	0.013	0.000	0.000	0.013 ^b	0.007 ^b	0.006

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)										
Map Site	USGS Station	Sample												
Number	STORET ID	No.	Collection Date	52	53	56/60	6	63	66	7/9	70/76	74	77/110	8/5
Method Detection Level (MDL)				0.0075	0.0040	0.0080	0.0110	0.0120	0.0120	0.0055	0.0120	0.0065	0.0110	0.0240
1	430575	04122255	5/14/2002	0.016	0.000	0.003 ^b	0.004 ^b	0.000	0.004 ^b	NAI	0.010 ^b	0.000	0.006 ^b	0.000
1	430575	04122255	6/25/2002	NAI	0.000	0.005 ^b	0.000	0.002 ^b	0.006 ^b	NAI	0.026	0.002 ^b	0.012 ^b	NAI
1	430575	04122255	8/6/2002	0.015	0.000	0.002 ^b	0.008 ^b	0.000	0.000	NAI	0.008 ^b	0.000	0.008 ^b	0.073
1	430575	04122255	10/8/2002	0.007 ^b	0.000	0.002 ^b	0.007 ^b	0.000	0.000	0.005 ^b	0.007 ^b	0.000	0.005 ^b	NAI
2	430578	04122330	5/15/2002	0.009 ^b	0.000	0.002 ^b	0.000	0.000	0.003 ^b	0.000	0.006 ^b	0.000	0.009 ^b	0.000
2	430578	04122330	6/25/2002	0.022	0.000	0.004 ^b	0.000	0.000	0.005 ^b	NAI	0.022	0.002 ^b	0.014 ^b	NAI
2	430578	04122330	8/6/2002	0.013	0.000	0.003 ^b	0.006 ^b	0.000	0.003 ^b	NAI	0.008 ^b	0.001 ^b	0.010 ^b	0.068
2	430578	04122330	10/8/2002	0.027	0.000	0.008 ^b	0.010 ^b	0.000	0.032	0.007 ^b	0.023	0.007 ^b	0.030	0.080
3	430591	04122390	5/15/2002	0.014	0.000	0.005 ^b	0.009 ^b	0.000	0.013 ^b	0.008 ^b	0.015 ^b	0.000	0.021	0.063
3	430591	04122390	6/26/2002	0.015	0.000	0.004 ^b	0.010 ^b	0.000	0.008 ^b	NAI	0.011 ^b	0.003 ^b	0.020	0.082
3	430591	04122390	8/7/2002	0.014	0.000	0.004 ^b	0.008 ^b	0.000	0.008 ^b	NAI	0.010 ^b	0.000	0.013 ^b	0.074
3	430591	04122390	10/9/2002	0.028	0.000	0.009 ^b	0.007 ^b	0.000	0.039	NAI	0.027	0.008 ^b	0.040	0.068
4	430592	04122327	5/14/2002	0.011 ^b	0.000	0.000	0.000	0.000	0.000	0.005 ^b	NAI	0.000	0.005 ^b	0.021 ^b
4	430592	04122327	6/25/2002	0.018	0.000	0.003 ^b	0.000	0.000	0.004 ^b	0.010	0.011 ^b	0.000	0.008 ^b	0.043
4	430592	04122327	8/6/2002	0.044	0.007	0.007 ^b	0.023	0.000	0.011 ^b	NAI	0.014	0.005 ^b	0.018	0.150
4	430592	04122327	10/8/2002	0.007 ^b	0.000	0.002 ^b	0.000	0.000	0.006 ^b	0.000	0.007 ^b	0.000	0.008 ^b	0.000
5	530227	04122402	5/15/2002	0.007 ^b	0.000	0.001 ^b	0.000	0.000	0.000	NAI	0.006 ^b	0.000	0.003 ^b	0.000
5	530227	04122402	6/26/2002	0.021	0.000	0.002 ^b	0.000	0.000	0.002 ^b	NAI	0.011 ^b	0.001 ^b	0.004 ^b	NAI
5	530227	04122402	8/7/2002	0.014	0.000	0.002 ^b	0.000	0.000	0.000	0.000	0.006 ^b	0.001 ^b	0.005 ^b	NAI
5	530227	04122402	10/9/2002	NAI	0.000	0.002 ^b	0.000	0.000	0.008 ^b	NAI	0.010 ^b	0.000	0.003 ^b	0.000
6	530235	04122450	5/16/2002	0.020	0.000	0.003 ^b	0.009 ^b	0.000	0.007 ^b	NAI	0.012 ^b	0.000	0.011 ^b	0.069
6	530235	04122450	6/27/2002	0.015	0.000	0.003 ^b	0.008 ^b	0.002 ^b	0.005 ^b	0.013	0.009 ^b	0.000	0.009 ^b	0.086
6	530235	04122450	8/7/2002	0.020	0.000	0.002 ^b	0.012 ^b	0.000	0.000	0.009	0.000	0.000	0.009 ^b	0.108
6	530235	04122450	10/9/2002	0.023	0.000	0.006 ^b	0.000	0.000	0.024	0.008 ^b	0.019	0.002 ^b	0.024	0.072
7	620248	04122435	5/15/2002	0.013	0.000	0.001 ^b	0.000	0.000	0.002 ^b	NAI	0.008 ^b	0.000	0.004 ^b	0.000
7	620248	04122435	6/26/2002	0.025	0.000	0.004 ^b	0.000	0.000	0.005 ^b	0.011	0.011 ^b	0.002 ^b	0.006 ^b	NAI
7	620248	04122435	8/7/2002	0.016	0.000	0.003 ^b	0.000	0.000	0.000	0.005 ^b	0.000	0.002 ^b	0.005 ^b	0.043
8	620249	04122280	5/14/2002	NAI	0.000	0.001 ^b	0.000	0.000	0.002 ^b	0.004 ^b	0.004 ^b	0.000	0.004 ^b	0.024 ^b
8	620249	04122280	6/25/2002	0.020	0.000	0.002 ^b	0.000	0.000	0.003 ^b	NAI	0.010 ^b	0.003 ^b	0.008 ^b	0.046
8	620249	04122280	8/6/2002	0.051	0.003 ^b	0.011 ^b	0.016	0.000	0.015 ^b	0.014	0.024	0.006 ^b	0.020	0.128
9	530027	04122500	5/15/2002	0.016	0.000	0.004 ^b	0.000	0.000	0.010 ^b	0.000	0.010 ^b	0.002 ^b	0.011 ^b	0.000
9	530027	04122500	6/26/2002	NAI	0.000	0.008 ^b	0.000	0.002 ^b	0.030	0.004 ^b	0.024	0.009	0.037	0.014 ^b
9	530027	04122500	8/7/2002	NAI	0.000	0.009 ^b	0.000	0.000	0.031	NAI	0.024	0.007 ^b	0.035	0.072

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 2. Pere Marquette River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)									
Map Site	USGS Station	Sample											
Number	STORET ID	No.	Collection Date	82	83	85	87	89	91	92/84	95	97	99
Method Detection Level (MDL)				0.0035	0.0045	0.0055	0.0050	0.0030	0.0055	0.0120	0.0060	0.0030	0.0040
1	430575	04122255	5/14/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.006 ^b	0.000	0.000	0.002 ^b
1	430575	04122255	6/25/2002	NAI	0.000	0.003 ^b	0.005 ^b	NAI	0.002 ^b	0.000	0.009	0.001 ^b	0.004 ^b
1	430575	04122255	8/6/2002	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.002 ^b	0.000	0.007 ^b	0.000	0.002 ^b
1	430575	04122255	10/8/2002	0.000	0.000	0.000	0.002 ^b	0.003 ^b	0.000	0.000	0.005 ^b	0.000	0.002
2	430578	04122330	5/15/2002	0.000	0.000	0.003 ^b	0.003 ^b	0.000	0.000	0.000	0.005 ^b	0.001 ^b	0.004 ^b
2	430578	04122330	6/25/2002	NAI	0.000	0.005 ^b	0.005 ^b	NAI	0.003 ^b	0.000	0.007 ^b	0.002 ^b	0.007
2	430578	04122330	8/6/2002	0.000	0.000	0.003 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.005 ^b	0.001 ^b	0.004 ^b
2	430578	04122330	10/8/2002	0.002 ^b	0.000	0.010	0.009	0.003 ^b	0.005 ^b	0.000	0.018	0.006	0.015
3	430591	04122390	5/15/2002	0.001 ^b	0.000	0.008	0.008	0.002 ^b	0.003 ^b	0.000	0.010	0.003 ^b	0.011
3	430591	04122390	6/26/2002	0.000	0.001 ^b	0.008	0.006	0.002 ^b	0.000	0.000	0.008	0.003 ^b	0.009
3	430591	04122390	8/7/2002	0.000	0.000	0.004 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.006 ^b	0.002 ^b	0.005
3	430591	04122390	10/9/2002	0.002 ^b	0.002 ^b	0.015	0.013	0.003 ^b	0.006 ^b	NAI	0.020	0.007	0.020
4	430592	04122327	5/14/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.004 ^b	0.000	0.000
4	430592	04122327	6/25/2002	0.000	0.000	0.003 ^b	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.001 ^b	0.003 ^b
4	430592	04122327	8/6/2002	0.000	0.000	0.003 ^b	0.009	0.002 ^b	0.004 ^b	0.019	0.028	0.004	0.006
4	430592	04122327	10/8/2002	0.000	0.000	0.002 ^b	0.003 ^b	0.002 ^b	0.000	0.000	0.007 ^b	0.001 ^b	0.003 ^b
5	530227	04122402	5/15/2002	0.000	0.000	0.000	0.001 ^b	0.000	0.000	0.000	0.006 ^b	0.000	0.001 ^b
5	530227	04122402	6/26/2002	0.000	0.000	0.001 ^b	0.002 ^b	0.000	0.000	0.000	0.004 ^b	0.001 ^b	0.002 ^b
5	530227	04122402	8/7/2002	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	NAI	0.006 ^b	0.001 ^b	0.001 ^b
5	530227	04122402	10/9/2002	0.000	0.000	0.000	0.005 ^b	NAI	0.000	0.000	0.007 ^b	0.000	0.002 ^b
6	530235	04122450	5/16/2002	0.001 ^b	0.000	0.003 ^b	0.005 ^b	0.002 ^b	0.000	0.000	0.008 ^b	0.001 ^b	0.004 ^b
6	530235	04122450	6/27/2002	0.000	0.000	0.004 ^b	0.003 ^b	0.000	0.000	0.000	0.004 ^b	0.001 ^b	0.004 ^b
6	530235	04122450	8/7/2002	0.000	0.000	0.000	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.001 ^b	0.002 ^b
6	530235	04122450	10/9/2002	0.002 ^b	0.001 ^b	0.008	0.009	0.002 ^b	0.003 ^b	0.000	0.014	0.004 ^b	0.012
7	620248	04122435	5/15/2002	0.000	0.000	0.000	0.002 ^b	0.000	0.000	0.009 ^b	0.004 ^b	0.000	0.002 ^b
7	620248	04122435	6/26/2002	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.006 ^b	0.001 ^b	0.002 ^b
7	620248	04122435	8/7/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.005 ^b	0.001 ^b	0.001 ^b
8	620249	04122280	5/14/2002	0.000	0.000	0.000	0.002 ^b	0.000	0.000	0.000	0.003 ^b	0.000	0.001 ^b
8	620249	04122280	6/25/2002	NAI	0.000	0.002 ^b	0.007	NAI	0.000	0.000	0.005 ^b	0.002 ^b	0.003 ^b
8	620249	04122280	8/6/2002	0.000	0.002 ^b	0.004 ^b	0.009	0.002 ^b	0.005 ^b	NAI	0.027	0.004 ^b	0.006
9	530027	04122500	5/15/2002	0.000	0.000	0.004 ^b	0.004 ^b	0.002 ^b	0.000	0.009 ^b	0.008	0.002 ^b	0.005 ^b
9	530027	04122500	6/26/2002	0.003 ^b	0.001 ^b	0.016	0.012	0.004	0.006 ^b	NAI	0.014	0.007	0.019
9	530027	04122500	8/7/2002	0.000	0.000	0.020	0.013	NAI	0.007 ^b	NAI	0.015	0.008	0.020

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations

(ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference)

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	Calculated Total PCB ^a (ng/L)	PCB Congeners (ng/L)									
					101	118	123/149	128	132/153/105	135/144	136	137/176	141	146
Detection Level (MDL)					0.0055	0.0080	0.0050	0.0045	0.0100	0.0065	0.0150	0.0065	0.0040	0.0055
10	180128	04121310	5/13/2002	0.242	0.004 ^b	0.002 ^b	0.001 ^b	0.000	0.005 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.000
10	180128	04121310	6/24/2002	0.538	0.000	0.004 ^b	0.004 ^b	0.000	0.007 ^b	0.000	0.000	0.000	0.001 ^b	NAI
10	180128	04121310	8/5/2002	0.285	0.003 ^b	0.000	0.002 ^b	0.000	0.004 ^b	0.000	0.000	0.000	0.000	0.000
10	180128	04121310	10/7/2002	0.140	0.005 ^b	0.000	0.000	0.000	0.002 ^b	0.000	0.000	0.000	0.000	NAI
11	540034	04121650	5/16/2002	0.700	0.049	0.031	0.016	0.008	0.042	0.006 ^b	0.004 ^b	0.000	0.005	0.005 ^b
11	540034	04121650	6/27/2002	0.419	0.014	0.012	0.006	0.002 ^b	0.016	0.002 ^b	0.000	0.000	0.001 ^b	0.003 ^b
11	540034	04121650	8/8/2002	0.320	0.012	0.007 ^b	0.004 ^b	0.002 ^b	0.010 ^b	0.000	0.000	0.000	0.001 ^b	0.002 ^b
11	540034	04121650	10/10/2002	0.931	0.059	0.027	0.016	0.006	0.036	0.006 ^b	0.004 ^b	0.000	0.004 ^b	0.007
12	540137	04121855	5/17/2002	0.367	0.006 ^b	0.003 ^b	0.002 ^b	0.000	0.002 ^b	0.001 ^b	0.000	0.000	0.000	NAI
12	540137	04121855	6/27/2002	0.382	0.004 ^b	0.004 ^b	0.002 ^b	0.001 ^b	0.003 ^b	0.000	0.000	0.000	0.001 ^b	NAI
12	540137	04121855	8/8/2002	0.334	0.006 ^b	0.002 ^b	0.002 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.000	0.000
13	620250	04122000	5/16/2002	0.177	0.004 ^b	0.003 ^b	0.002 ^b	0.001 ^b	0.007 ^b	0.000	0.000	0.000	0.001 ^b	0.002 ^b
13	620250	04122000	6/28/2002	0.279	0.005 ^b	0.004 ^b	0.002 ^b	0.001 ^b	0.008 ^b	0.000	0.000	0.000	0.001 ^b	0.005 ^b
13	620250	04122000	8/8/2002	0.428	0.007 ^b	0.002 ^b	0.002 ^b	0.001 ^b	0.006 ^b	0.000	0.000	0.000	0.001 ^b	0.000
14	670222	04121365	5/13/2002	0.360	0.006 ^b	0.002 ^b	0.001 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.000	NAI
14	670222	04121365	6/24/2002	0.419	0.000	0.003 ^b	0.003 ^b	0.000	0.007 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.000
14	670222	04121365	8/5/2002	0.301	0.003 ^b	0.003 ^b	0.002 ^b	0.000	0.002 ^b	0.000	0.000	0.000	0.001 ^b	NAI
15	720136	04120900	5/13/2002	0.164	0.000	0.000	0.001 ^b	0.000	0.003 ^b	0.000	0.000	0.000	0.000	0.000
15	720136	04120900	6/24/2002	0.448	0.005 ^b	0.002 ^b	0.002 ^b	0.001 ^b	0.004 ^b	0.001 ^b	0.000	0.000	0.000	0.001 ^b
15	720136	04120900	8/6/2002	0.374	0.008	0.004 ^b	0.003 ^b	0.001 ^b	0.006 ^b	0.000	0.000	0.000	0.001 ^b	0.000
15	720136	04120900	10/7/2002	0.139	0.004 ^b	0.002 ^b	0.002 ^b	0.001 ^b	0.006 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.000
16	610273	04122030	4/11/2002	0.269	0.016	0.006 ^b	0.005 ^b	0.002 ^b	0.007 ^b	0.003 ^b	0.000	0.000	0.002 ^b	NAI
16	610273	04122030	5/16/2002	0.193	0.007	0.004 ^b	0.003 ^b	0.001 ^b	0.007 ^b	0.000	0.000	0.000	0.001 ^b	0.005 ^b
16	610273	04122030	6/27/2002	0.309	0.004 ^b	0.005 ^b	0.003 ^b	0.002 ^b	0.009 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.004 ^b
16	610273	04122030	8/8/2002	0.360	0.004 ^b	0.001 ^b	0.001 ^b	0.001 ^b	0.009 ^b	0.002 ^b	0.000	0.000	0.000	0.000
16	610273	04122030	10/10/2002	0.169	0.007	0.004 ^b	0.004 ^b	0.001 ^b	0.007 ^b	0.001 ^b	0.000	0.000	0.001 ^b	NAI
17	670008	04121621	5/14/2002	0.376	0.006 ^b	0.002 ^b	0.003 ^b	0.001 ^b	0.004 ^b	0.002 ^b	0.000	0.000	0.002 ^b	NAI
17	670008	04121621	6/25/2002	0.331	0.005 ^b	0.005 ^b	0.003 ^b	0.000	0.008 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.004 ^b
17	670008	04121621	8/6/2002	0.253	0.003 ^b	0.000	0.002 ^b	0.000	0.005 ^b	0.000	0.000	0.000	0.000	0.000

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued
[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	PCB Congeners (ng/L)										
				15/17	151	158	16/32	163/138	167	170/190	172	174	177	178
Method Detection Level (MDL)				0.0150	0.0050	0.0075	0.0110	0.0110	0.0060	0.0055	0.0075	0.0055	0.0060	0.0070
10	180128	04121310	5/13/2002	0.013 ^b	0.000	0.000	0.010 ^b	0.007 ^b	0.000	0.002 ^b	0.000	0.002 ^b	0.000	0.000
10	180128	04121310	6/24/2002	0.026	0.000	0.000	0.032	NAI	0.000	0.002 ^b	0.000	0.002 ^b	0.002 ^b	0.000
10	180128	04121310	8/5/2002	0.016 ^b	0.000	0.000	0.017	0.000	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
10	180128	04121310	10/7/2002	0.016 ^b	0.000	0.000	0.023	0.004 ^b	0.000	0.000	0.000	0.000	0.000	0.000
11	540034	04121650	5/16/2002	0.013 ^b	0.004 ^b	0.007 ^b	0.014 ^b	0.043	0.001 ^b	0.004 ^b	0.000	0.003 ^b	0.002 ^b	0.000
11	540034	04121650	6/27/2002	0.024	0.001 ^b	0.003 ^b	0.023	0.017	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
11	540034	04121650	8/8/2002	0.021 ^b	0.000	0.000	0.018	0.010 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
11	540034	04121650	10/10/2002	0.013 ^b	0.000	0.005 ^b	NAI	0.038	0.000	0.004 ^b	0.000	0.003 ^b	0.003 ^b	0.000
12	540137	04121855	5/17/2002	0.018	0.001 ^b	0.000	0.017	0.005 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
12	540137	04121855	6/27/2002	0.024	0.000	0.000	0.018	0.000	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
12	540137	04121855	8/8/2002	0.025	0.000	0.000	0.022	0.003 ^b	0.000	0.000	0.000	0.000	0.000	0.000
13	620250	04122000	5/16/2002	0.008 ^b	0.000	0.000	0.007 ^b	0.009 ^b	0.000	0.002 ^b	0.000	0.001 ^b	0.001 ^b	0.000
13	620250	04122000	6/28/2002	0.013 ^b	0.000	0.000	NAI	0.009 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
13	620250	04122000	8/8/2002	0.025	0.000	0.000	0.022	0.008 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
14	670222	04121365	5/13/2002	0.022	0.000	0.000	0.018	0.000	0.000	0.001 ^b	0.000	0.000	0.000	0.000
14	670222	04121365	6/24/2002	0.020	0.000	0.000	0.028	0.009 ^b	0.000	0.002 ^b	0.000	0.002 ^b	0.000	0.000
14	670222	04121365	8/5/2002	0.018	0.000	0.000	0.015	0.000	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
15	720136	04120900	5/13/2002	0.008 ^b	0.000	0.000	0.008 ^b	0.005 ^b	0.000	0.000	0.000	0.000	0.000	0.000
15	720136	04120900	6/24/2002	0.025	0.001 ^b	0.000	0.022	0.003 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
15	720136	04120900	8/6/2002	0.020	0.001 ^b	0.000	0.024	0.006 ^b	0.000	0.000	0.000	0.001 ^b	0.001 ^b	0.000
15	720136	04120900	10/7/2002	0.003 ^b	0.001 ^b	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.002 ^b	0.001 ^b	0.000
16	610273	04122030	4/11/2002	0.016 ^b	0.001 ^b	0.000	0.010 ^b	NAI	0.000	0.000	0.000	0.002 ^b	0.002 ^b	0.000
16	610273	04122030	5/16/2002	0.010 ^b	0.001 ^b	0.000	0.009 ^b	0.009 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
16	610273	04122030	6/27/2002	0.015 ^b	0.001 ^b	0.000	0.016	0.012 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000
16	610273	04122030	8/8/2002	0.020 ^b	0.000	0.000	0.015 ^b	0.011 ^b	0.000	0.000	0.000	0.001 ^b	0.001 ^b	0.000
16	610273	04122030	10/10/2002	0.009 ^b	0.001 ^b	0.000	0.010 ^b	0.000	0.000	0.002 ^b	0.001 ^b	0.002 ^b	0.002 ^b	0.001 ^b
17	670008	04121621	5/14/2002	0.022 ^b	0.001 ^b	0.000	0.018	0.006 ^b	0.000	0.002 ^b	0.000	0.000	0.002 ^b	0.001 ^b
17	670008	04121621	6/25/2002	0.020	0.000	0.000	0.025	0.009 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.000	0.000
17	670008	04121621	8/6/2002	0.013 ^b	0.000	0.000	0.012 ^b	0.006 ^b	0.000	0.001 ^b	0.000	0.001 ^b	0.001 ^b	0.000

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued

[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)										
Map Site	USGS Station	Sample												
Number	STORET ID	No.	Collection Date	18	180	183	185	187/182	19	193	194	198	199	201
Method Detection Level (MDL)				0.0070	0.0065	0.0055	0.0035	0.0050	0.0035	0.0075	0.0055	0.0075	0.0045	0.0090
10	180128	04121310	5/13/2002	0.005 ^b	0.002 ^b	0.000	0.000	0.001 ^b	0.010	0.000	0.001 ^b	0.000	0.000	0.002 ^b
10	180128	04121310	6/24/2002	0.018	0.003 ^b	0.001 ^b	0.000	0.003 ^b	NAI	0.000	0.002 ^b	0.000	0.000	0.003 ^b
10	180128	04121310	8/5/2002	0.013	0.002 ^b	0.000	0.000	0.001 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.001 ^b
10	180128	04121310	10/7/2002	0.006 ^b	0.000	0.000	0.000	0.000	NAI	0.000	0.000	0.000	0.000	0.000
11	540034	04121650	5/16/2002	0.007 ^b	0.005 ^b	0.002 ^b	0.000	0.003 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.003 ^b
11	540034	04121650	6/27/2002	0.011	0.002 ^b	0.001 ^b	0.000	0.001 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.002 ^b
11	540034	04121650	8/8/2002	0.008 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.000	0.001 ^b
11	540034	04121650	10/10/2002	0.015	0.005 ^b	0.002 ^b	0.000	0.004 ^b	0.006	0.000	0.002 ^b	0.000	0.000	0.004 ^b
12	540137	04121855	5/17/2002	0.011	0.001 ^b	0.000	0.000	0.001 ^b	0.005	0.000	0.001 ^b	0.000	0.000	0.001 ^b
12	540137	04121855	6/27/2002	0.009	0.001 ^b	0.000	0.000	0.001 ^b	0.004	0.000	0.001 ^b	0.000	0.000	0.001 ^b
12	540137	04121855	8/8/2002	0.012	0.001 ^b	0.000	0.000	0.001 ^b	0.000	0.000	0.000	0.000	0.000	0.000
13	620250	04122000	5/16/2002	0.000	0.001 ^b	0.001 ^b	0.000	0.001 ^b	0.004	0.000	0.000	0.000	0.000	0.001 ^b
13	620250	04122000	6/28/2002	0.006 ^b	0.001 ^b	0.001 ^b	0.000	0.002 ^b	0.008	0.000	0.001 ^b	0.000	0.000	0.001 ^b
13	620250	04122000	8/8/2002	0.013	0.002 ^b	0.000	0.000	0.002 ^b	0.007	0.000	0.000	0.000	0.000	0.001 ^b
14	670222	04121365	5/13/2002	0.011	0.000	0.000	0.000	0.001 ^b	0.010	0.000	0.001 ^b	0.000	0.000	0.000
14	670222	04121365	6/24/2002	0.013	0.002 ^b	0.000	0.000	0.002 ^b	0.009	0.000	0.001 ^b	0.000	0.000	0.002 ^b
14	670222	04121365	8/5/2002	0.014	0.001 ^b	0.000	0.000	0.001 ^b	0.005	0.000	0.001 ^b	0.000	0.000	0.001 ^b
15	720136	04120900	5/13/2002	0.003 ^b	0.001 ^b	0.000	0.000	0.001 ^b	0.007	0.000	0.000	0.000	0.000	0.000
15	720136	04120900	6/24/2002	0.009	0.000	0.001 ^b	0.000	0.001 ^b	NAI	0.000	0.000	0.000	0.000	0.001 ^b
15	720136	04120900	8/6/2002	0.011	0.001 ^b	0.000	0.000	0.001 ^b	0.007	0.000	0.001 ^b	0.000	0.000	0.001 ^b
15	720136	04120900	10/7/2002	0.005 ^b	0.003 ^b	0.001 ^b	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.002 ^b
16	610273	04122030	4/11/2002	0.010 ^b	0.003 ^b	0.001 ^b	0.000	0.003 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.007 ^b
16	610273	04122030	5/16/2002	0.006 ^b	0.001 ^b	0.001 ^b	0.000	0.002 ^b	0.003 ^b	0.000	0.001 ^b	0.000	0.000	0.001 ^b
16	610273	04122030	6/27/2002	0.010	0.003 ^b	0.001 ^b	0.000	0.003 ^b	0.006	0.000	0.001 ^b	0.000	0.000	0.002 ^b
16	610273	04122030	8/8/2002	0.007 ^b	0.003 ^b	0.001 ^b	0.000	0.003 ^b	0.008	0.000	0.001 ^b	0.000	0.000	0.002 ^b
16	610273	04122030	10/10/2002	0.005 ^b	0.003 ^b	0.001 ^b	0.000	0.003 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.000	0.002 ^b
17	670008	04121621	5/14/2002	0.009 ^b	0.003 ^b	0.000	0.000	0.003 ^b	0.012	0.000	0.002 ^b	0.000	0.000	0.003 ^b
17	670008	04121621	6/25/2002	0.015	0.001 ^b	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.001 ^b	0.000	0.000	0.001 ^b
17	670008	04121621	8/6/2002	0.008	0.001 ^b	0.000	0.000	0.001 ^b	0.005	0.000	0.001 ^b	0.000	0.000	0.001 ^b

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued

[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)										
Map Site	USGS Station	Sample												
Number	STORET ID	No.	Collection Date	202/171	203/196	206	207	208/195	22	24/27	25	26	28/31	3
Method Detection Level (MDL)				0.0040	0.0140	0.0035	0.0035	0.0040	0.0110	0.0035	0.0060	0.0070	0.0200	0.2200
10	180128	04121310	5/13/2002	0.000	0.000	0.002 ^b	0.000	0.000	0.012 ^b	0.000	0.000	0.000	0.006 ^b	0.000
10	180128	04121310	6/24/2002	0.001 ^b	0.004 ^b	0.003 ^b	0.000	0.001 ^b	0.026	0.002 ^b	0.000	0.000	0.021 ^b	0.000
10	180128	04121310	8/5/2002	0.000	0.001 ^b	0.001 ^b	0.000	0.000	NAI	0.001 ^b	0.002 ^b	0.000	0.016 ^b	0.000
10	180128	04121310	10/7/2002	0.000	0.000	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.014 ^b	0.000
11	540034	04121650	5/16/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.001 ^b	0.009 ^b	0.000	0.000	0.000	0.023 ^b	0.000
11	540034	04121650	6/27/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.000 ^b	0.010 ^b	0.002 ^b	0.004 ^b	0.004 ^b	0.031	0.000
11	540034	04121650	8/8/2002	0.001 ^b	0.000	0.001 ^b	0.000	0.000	NAI	0.000	0.000	0.000	0.029	0.000
11	540034	04121650	10/10/2002	0.002 ^b	0.005 ^b	0.002 ^b	0.000	0.001 ^b	0.029	0.004 ^b	0.000	0.000	0.085	0.000
12	540137	04121855	5/17/2002	0.000	0.002 ^b	0.001 ^b	0.000	0.000	0.011 ^b	0.000	0.000	0.000	0.029	0.000
12	540137	04121855	6/27/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.000	0.010 ^b	0.000	0.001 ^b	0.002 ^b	0.029	0.000
12	540137	04121855	8/8/2002	0.000	0.000	0.000	0.000	0.000	0.011 ^b	0.000	0.000	0.000	0.024 ^b	0.000
13	620250	04122000	5/16/2002	0.001 ^b	0.000	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.010 ^b	0.000
13	620250	04122000	6/28/2002	0.001 ^b	0.002 ^b	0.000	0.000	0.000	0.006 ^b	0.000	0.000	0.000	0.013 ^b	0.000
13	620250	04122000	8/8/2002	0.001 ^b	0.000	0.000	0.000	0.000	0.007 ^b	0.000	0.000	0.000	0.028 ^b	0.000
14	670222	04121365	5/13/2002	0.000	0.000	0.000	0.000	0.000	0.009 ^b	0.002 ^b	0.000	0.000	0.025 ^b	0.000
14	670222	04121365	6/24/2002	0.001 ^b	0.004 ^b	0.000	0.000	0.001 ^b	0.011 ^b	0.002 ^b	0.000	0.000	0.016 ^b	0.000
14	670222	04121365	8/5/2002	0.000	0.002 ^b	0.000	0.000	0.000	0.006 ^b	0.001 ^b	0.000	0.000	0.015 ^b	0.000
15	720136	04120900	5/13/2002	0.000	0.000	0.000	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.010 ^b	0.000
15	720136	04120900	6/24/2002	0.000	0.000	0.000	0.000	0.000	0.007 ^b	0.000	0.000	0.000	0.025	0.000
15	720136	04120900	8/6/2002	0.000	0.000	0.000	0.000	0.000	0.009 ^b	0.000	0.000	0.000	0.031	0.000
15	720136	04120900	10/7/2002	0.001 ^b	0.000	0.000	0.000	0.001 ^b	0.000	NAI	0.000	0.000	0.005 ^b	0.000
16	610273	04122030	4/11/2002	0.001 ^b	0.004 ^b	0.001 ^b	0.000	0.001 ^b	0.006 ^b	0.000	0.000	0.000	0.016 ^b	0.000
16	610273	04122030	5/16/2002	0.001 ^b	0.000	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.012 ^b	0.000
16	610273	04122030	6/27/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.001 ^b	0.005 ^b	0.000	0.000	0.000	0.014 ^b	0.000
16	610273	04122030	8/8/2002	0.001 ^b	0.002 ^b	0.001 ^b	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.023 ^b	0.000
16	610273	04122030	10/10/2002	0.001 ^b	0.003 ^b	0.001 ^b	0.000	0.001 ^b	0.004 ^b	0.000	0.000	0.000	0.000	0.000
17	670008	04121621	5/14/2002	0.000	0.004 ^b	0.001 ^b	0.000	0.000	0.008 ^b	0.000	0.000	0.000	0.032 ^b	0.000
17	670008	04121621	6/25/2002	0.000	0.003 ^b	0.000	0.000	0.001 ^b	0.011 ^b	0.001 ^b	0.000	0.000	0.017 ^b	0.000
17	670008	04121621	8/6/2002	0.000	0.002 ^b	0.000	0.000	0.000	0.007 ^b	0.000	0.000	0.000	0.012 ^b	0.000

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued

[ng/l, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)										
Map Site	USGS Station	Sample												
Number	STORET ID	No.	Collection Date	33	37/42	4/10	40	41/71/64	44	45	46	47/48	49	51
Method Detection Level (MDL)				0.0075	0.0100	0.0250	0.0050	0.0100	0.0065	0.0045	0.0045	0.0090	0.0050	0.0035
10	180128	04121310	5/13/2002	0.000	0.000	0.025 ^b	NAI	0.000	0.002 ^b	0.000	0.000	0.003 ^b	NAI	0.002 ^b
10	180128	04121310	6/24/2002	0.008 ^b	0.015	0.055	NAI	0.007 ^b	0.011	0.000	0.005 ^b	0.006 ^b	0.022	0.007
10	180128	04121310	8/5/2002	NAI	0.010 ^b	0.025 ^b	NAI	0.000	0.004 ^b	0.001 ^b	0.002 ^b	0.010 ^b	0.003 ^b	NAI
10	180128	04121310	10/7/2002	0.006 ^b	NAI	0.000	0.000	0.005 ^b	0.016	0.000	0.000	0.000	0.000	0.004 ^b
11	540034	04121650	5/16/2002	0.007 ^b	0.007 ^b	0.000	NAI	0.011 ^b	0.019	0.003 ^b	0.000	0.010 ^b	0.012	0.004 ^b
11	540034	04121650	6/27/2002	0.005 ^b	0.009 ^b	0.014 ^b	NAI	0.010 ^b	0.013	0.002 ^b	0.000	0.015	0.012	0.005
11	540034	04121650	8/8/2002	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.010	0.003 ^b	0.000	0.008 ^b	0.009	NAI
11	540034	04121650	10/10/2002	NAI	0.019	0.000	NAI	0.021	0.030	0.000	0.000	0.015	0.021	0.006
12	540137	04121855	5/17/2002	0.006 ^b		0.015 ^b	NAI	0.007 ^b	0.006 ^b	0.000	0.000	0.012	0.010	0.003 ^b
12	540137	04121855	6/27/2002	0.005 ^b	0.006 ^b	0.012 ^b	NAI	0.009 ^b	0.010	0.002 ^b	0.000	0.021	0.012	0.008
12	540137	04121855	8/8/2002	0.007 ^b	NAI	0.007 ^b	0.000	0.010 ^b	0.014	0.002 ^b	0.000	0.014	0.011	0.003 ^b
13	620250	04122000	5/16/2002	0.005 ^b	0.000	0.000	0.000	0.003 ^b	0.003 ^b	0.000	0.000	0.006 ^b	0.005 ^b	0.004
13	620250	04122000	6/28/2002	NAI	0.000	0.036	NAI	0.005 ^b	0.011	0.000	0.000	0.007 ^b	0.004 ^b	0.003 ^b
13	620250	04122000	8/8/2002	0.005 ^b	NAI	0.029 ^b	NAI	0.007 ^b	0.005 ^b	0.003 ^b	0.002 ^b	0.015	0.010	0.007
14	670222	04121365	5/13/2002	0.007 ^b	NAI	0.031 ^b	NAI	0.003 ^b	0.007 ^b	0.004 ^b	0.000	0.014	NAI	0.004 ^b
14	670222	04121365	6/24/2002	0.007 ^b	0.009 ^b	0.050	NAI	0.004 ^b	0.007 ^b	0.000	0.000	0.004 ^b	0.004 ^b	0.006
14	670222	04121365	8/5/2002	0.005 ^b	0.005 ^b	0.029 ^b	0.000	0.003 ^b	0.004 ^b	0.002 ^b	0.000	0.008 ^b	0.004 ^b	0.006
15	720136	04120900	5/13/2002	0.009 ^b	0.000	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	0.008 ^b	0.007	0.004 ^b
15	720136	04120900	6/24/2002	0.008 ^b	0.010 ^b	0.028 ^b	NAI	0.005 ^b	0.009	0.002 ^b	0.002 ^b	0.093	0.011	0.034
15	720136	04120900	8/6/2002	0.010	0.000	0.024 ^b	0.000	0.007 ^b	0.011	0.003 ^b	0.001 ^b	0.016	0.011	0.005
15	720136	04120900	10/7/2002	0.010	0.000	0.000	0.000	0.004 ^b	0.005 ^b	0.000	0.000	0.004 ^b	0.005 ^b	0.000
16	610273	04122030	4/11/2002	0.005 ^b	NAI	0.000	0.000	0.005 ^b	0.000	0.000	0.000	0.013 ^b	NAI	0.005 ^b
16	610273	04122030	5/16/2002	0.003 ^b	0.003 ^b	0.000	0.000	0.005 ^b	0.006 ^b	0.000	0.000	0.006 ^b	0.006	0.006
16	610273	04122030	6/27/2002	0.004 ^b	0.005 ^b	0.021 ^b	NAI	0.005 ^b	0.005 ^b	0.001 ^b	0.000	0.010 ^b	0.007	0.005
16	610273	04122030	8/8/2002	0.003 ^b	0.000	0.032 ^b	NAI	0.002 ^b	0.004 ^b	0.000	0.000	0.014	0.008	0.005 ^b
16	610273	04122030	10/10/2002	0.000	NAI	0.000	0.000	0.005 ^b	0.005 ^b	0.000	0.000	0.009 ^b	0.005 ^b	0.004 ^b
17	670008	04121621	5/14/2002	0.000	NAI	0.000	NAI	0.007 ^b	0.007 ^b	0.003 ^b	0.003 ^b	0.016	0.010	0.004 ^b
17	670008	04121621	6/25/2002	0.006 ^b	0.009 ^b	0.035	NAI	0.006 ^b	0.008	0.001 ^b	0.002 ^b	0.008 ^b	0.005 ^b	0.004
17	670008	04121621	8/6/2002	0.000	0.005 ^b	0.023 ^b	0.000	0.003 ^b	0.004 ^b	0.002 ^b	0.000	0.007 ^b	0.003 ^b	0.003 ^b

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued
[ng/L nanograms per liter; NAI, not analyzed due to uncontrollable interference]

Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	PCB Congeners (ng/L)										
				52	53	56/60	6	63	66	7/9	70/76	74	77/110	8/5
Method	Detection Level (MDL)			0.0075	0.0040	0.0080	0.0110	0.0120	0.0120	0.0055	0.0120	0.0065	0.0110	0.0240
10	180128	04121310	5/13/2002	0.033	0.000	0.000	0.000	0.000	0.000	NAI	NAI	0.000	0.005 ^b	0.073
10	180128	04121310	6/24/2002	0.037	0.000	0.003 ^b	0.017	0.000	0.006 ^b	0.017	0.011 ^b	0.000	0.009 ^b	0.120
10	180128	04121310	8/5/2002	0.017	0.000	0.000	0.008 ^b	0.000	0.002 ^b	NAI	0.005 ^b	0.001 ^b	0.005 ^b	0.089
10	180128	04121310	10/7/2002	0.012	0.000	0.003 ^b	0.000	0.000	0.000	0.000	0.000	0.000	0.007 ^b	0.000
11	540034	04121650	5/16/2002	0.052	0.000	0.008 ^b	0.000	0.000	0.010 ^b	0.006 ^b	0.027	0.005 ^b	0.062	NAI
11	540034	04121650	6/27/2002	0.039	0.000	0.004 ^b	0.000	0.000	0.005 ^b	NAI	0.013 ^b	0.003 ^b	0.022	NAI
11	540034	04121650	8/8/2002	0.026	0.000	0.004 ^b	0.000	0.000	0.005 ^b	0.006 ^b	0.000	0.002 ^b	0.016	0.049
11	540034	04121650	10/10/2002	0.061	0.003 ^b	0.014	0.000	0.000	0.020	0.000	0.036	0.009	0.065	0.055
12	540137	04121855	5/17/2002	0.058	0.000	0.004 ^b	0.000	0.000	0.006 ^b	0.008	0.011 ^b	0.001 ^b	0.007 ^b	0.063
12	540137	04121855	6/27/2002	0.079	0.001 ^b	0.005 ^b	0.000	0.000	0.006 ^b	0.003 ^b	0.012 ^b	0.002 ^b	0.008 ^b	0.037
12	540137	04121855	8/8/2002	0.048	0.000	0.003 ^b	0.008 ^b	0.000	0.006 ^b	0.000	0.007 ^b	0.002 ^b	0.008 ^b	0.052
13	620250	04122000	5/16/2002	0.030	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.009 ^b	0.000	0.007 ^b	0.016 ^b
13	620250	04122000	6/28/2002	0.008 ^b	0.000	0.002 ^b	0.000	0.000	0.003 ^b	NAI	0.009 ^b	0.000	0.009 ^b	0.069
13	620250	04122000	8/8/2002	0.026	0.000	0.003 ^b	0.012 ^b	0.000	0.006 ^b	0.008 ^b	0.011 ^b	0.000	0.011 ^b	0.111
14	670222	04121365	5/13/2002	0.035	0.000	0.003 ^b	0.010 ^b	0.000	0.000	0.009	NAI	0.000	0.008 ^b	0.089
14	670222	04121365	6/24/2002	0.027	0.000	0.002 ^b	0.014	0.000	0.003 ^b	0.013	0.006 ^b	0.000	0.007 ^b	0.102
14	670222	04121365	8/5/2002	0.014	0.000	0.002 ^b	0.010 ^b	0.000	0.002 ^b	NAI	0.004 ^b	0.000	0.004 ^b	0.094
15	720136	04120900	5/13/2002	0.054	0.000	0.000	0.000	0.000	0.000	0.004 ^b	0.008 ^b	0.000	0.004 ^b	NAI
15	720136	04120900	6/24/2002	0.029	0.000	0.003 ^b	NAI	0.000	0.003 ^b	NAI	0.004 ^b	0.000	0.008 ^b	0.076
15	720136	04120900	8/6/2002	0.029	0.000	0.004 ^b	NAI	0.000	0.007 ^b	0.007	0.000	0.001 ^b	0.011 ^b	0.070
15	720136	04120900	10/7/2002	0.015	0.000	0.003 ^b	0.000	0.000	0.005 ^b	0.002 ^b	0.008 ^b	0.000	0.008 ^b	0.000
16	610273	04122030	4/11/2002	0.036	0.000	0.003 ^b	0.000	0.000	0.006 ^b	0.000	0.011 ^b	0.000	0.018	NAI
16	610273	04122030	5/16/2002	0.028	0.000	0.003 ^b	0.000	0.000	0.003 ^b	0.000	0.007 ^b	0.001 ^b	0.009 ^b	0.000
16	610273	04122030	6/27/2002	0.018	0.000	0.002 ^b	0.000	0.000	0.003 ^b	NAI	0.006 ^b	0.000	0.009 ^b	0.068
16	610273	04122030	8/8/2002	0.018	0.001 ^b	0.002 ^b	0.010 ^b	0.000	0.003 ^b	0.003 ^b	0.000	0.000	0.009 ^b	0.104
16	610273	04122030	10/10/2002	0.014	0.000	0.003 ^b	0.000	0.000	0.005 ^b	0.004 ^b	0.006 ^b	0.002 ^b	0.009 ^b	0.000
17	670008	04121621	5/14/2002	0.030	0.000	0.005 ^b	0.000	0.000	0.007 ^b	0.010	0.015 ^b	0.000	0.008 ^b	0.086
17	670008	04121621	6/25/2002	0.026	0.000	0.002 ^b	0.014	0.000	0.005 ^b	0.019	0.007 ^b	0.000	0.008 ^b	NAI
17	670008	04121621	8/6/2002	0.013	0.000	0.002 ^b	0.008 ^b	0.000	0.000	NAI	0.005 ^b	0.000	0.004 ^b	0.080

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample

^b Below method of detection level (MDL)

Table 3. Muskegon River watershed total PCB and PCB congener concentrations-Continued

[ng/L, nanograms per liter; NAI, not analyzed due to uncontrollable interference]

				PCB Congeners (ng/L)									
Map Site	USGS Station	Sample											
Number	STORET ID	No.	Collection Date	82	83	85	87	89	91	92/84	95	97	99
Method Detection Level (MDL)				0.0035	0.0045	0.0055	0.0050	0.0030	0.0055	0.0120	0.0060	0.0030	0.0040
10	180128	04121310	5/13/2002	0.000	0.000	0.002 ^b	0.002 ^b	0.000	0.000	0.000	0.004 ^b	0.000	0.002 ^b
10	180128	04121310	6/24/2002	0.000	0.000	0.002 ^b	0.003 ^b	NAI	0.000	0.000	0.009	0.001 ^b	0.000
10	180128	04121310	8/5/2002	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	0.000	0.005 ^b	0.001 ^b	0.001 ^b
10	180128	04121310	10/7/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	NAI	0.006 ^b	0.000	0.002 ^b
11	540034	04121650	5/16/2002	0.005	0.002 ^b	0.010	0.028	0.002 ^b	0.009	NAI	0.047	0.012	0.017
11	540034	04121650	6/27/2002	0.000	0.001 ^b	0.004 ^b	0.009	0.000	0.003 ^b	NAI	0.014	0.004	0.006
11	540034	04121650	8/8/2002	0.000	0.000	0.003 ^b	0.007 ^b	0.000	0.002 ^b	0.000	0.015	0.003 ^b	0.005 ^b
11	540034	04121650	10/10/2002	0.004 ^b	0.003 ^b	0.011	0.029	0.006	0.012	NAI	0.063	0.014	0.020
12	540137	04121855	5/17/2002	0.000	0.000	0.001 ^b	0.004 ^b	0.002 ^b	0.003 ^b	0.005 ^b	0.009	0.001 ^b	0.002 ^b
12	540137	04121855	6/27/2002	0.000	0.000	0.002 ^b	0.005 ^b	0.000	0.002 ^b	0.000	0.007	0.002 ^b	0.003 ^b
12	540137	04121855	8/8/2002	0.000	0.000	0.001 ^b	0.004 ^b	0.000	0.002 ^b	0.000	0.009	0.001 ^b	0.002 ^b
13	620250	04122000	5/16/2002	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.000	0.000	0.004 ^b	0.001 ^b	0.002 ^b
13	620250	04122000	6/28/2002	0.000	0.000	0.005 ^b	0.004 ^b		0.002 ^b	0.000	0.005 ^b	0.001 ^b	0.003 ^b
13	620250	04122000	8/8/2002	0.000	0.000	0.002 ^b	0.005 ^b	0.000	0.000	0.000	0.010	0.001 ^b	0.003 ^b
14	670222	04121365	5/13/2002	0.000	0.000	0.002 ^b	0.003 ^b	0.003 ^b	0.000	0.011 ^b	0.006 ^b	0.000	0.002 ^b
14	670222	04121365	6/24/2002	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.000	0.003 ^b
14	670222	04121365	8/5/2002	0.000	0.000	0.001 ^b	0.003 ^b	0.000	0.001 ^b	0.000	0.005 ^b	0.001 ^b	0.001 ^b
15	720136	04120900	5/13/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.006 ^b	0.000	0.000
15	720136	04120900	6/24/2002	0.000	0.000	0.000	0.003 ^b	0.000	0.000	0.000	0.005 ^b	0.001 ^b	0.002 ^b
15	720136	04120900	8/6/2002	0.000	0.000	0.000	0.004 ^b	0.000	0.002 ^b	0.000	0.009	0.001 ^b	0.003 ^b
15	720136	04120900	10/7/2002	0.000	0.000	0.001 ^b	0.004 ^b	0.000	0.000	0.000	0.010	0.001 ^b	0.003 ^b
16	610273	04122030	4/11/2002	0.000	0.000	0.003 ^b	0.007 ^b	0.002 ^b	0.003 ^b	0.000	0.013	0.002 ^b	0.005 ^b
16	610273	04122030	5/16/2002	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.006 ^b	0.001 ^b	0.002 ^b
16	610273	04122030	6/27/2002	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.005 ^b	0.001 ^b	0.003 ^b
16	610273	04122030	8/8/2002	0.000	0.000	0.002 ^b	0.005 ^b	0.000	0.000	0.000	0.004 ^b	0.000	0.004 ^b
16	610273	04122030	10/10/2002	0.000	0.000	0.003 ^b	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.001 ^b	0.003 ^b
17	670008	04121621	5/14/2002	0.000	0.000	0.002 ^b	0.004 ^b	0.000	0.000	0.000	0.007 ^b	0.000	0.003 ^b
17	670008	04121621	6/25/2002	0.000	0.000	0.002 ^b	0.003 ^b	0.000	0.000	0.008 ^b	0.008	0.001 ^b	0.002 ^b
17	670008	04121621	8/6/2002	0.000	0.000	0.002 ^b	0.003 ^b	0.000	0.000	0.000	0.006 ^b	0.001 ^b	0.000

^a Total PCB concentrations were calculated from the sum of the PCB congener concentrations for each sample^b Below method of detection level (MDL)

**Appendix A. Summary of laboratory result remark codes and definitions
for water quality data**

Code	Definition
A	Value reported is the mean of two or more determinations.
C	Value calculated from other independent parameters.
DM	Dilution required due to matrix problems.
HT	Recommended laboratory holding time was exceeded before analysis.
K	Concentration below the quantification level shown.
NAV	Requested analysis not available.
QC	Quality control problems exist.
ST	Recommended sample collection/preservation technique not used.
T	Value reported is less than the quantification level.

Appendix B. Water-quality parameters for the Pere Marquette River watershed

[cfs, cubic feet per second; mg/L, milligram per liter; uS, microsiemens per centimeter; C, degrees celsius; NTU, nephelometric turbidity units]

Map Site No.	STORET ID	USGS Station No.	Sample Collection Date	Discharge (cfs)	Total Ammonia (mg/L)	Total Nitrate (mg/L)	Total Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorus (mg/L)	Total Ortho Phosphate (mg/L)	Total Sulfate (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Magnesium (mg/L)	Total Organic Carbon (mg/L)	Total Dissolved Solids (mg/L)
1	430575	04122255	5/14/2002	27.9	0.009 T	0.052 C	0.002	0.36	0.021	0.003	3	34.8	3	13.2	6.2	180
1	430575	04122255	6/25/2002	15.4	0.012	0.135 C	0.003	0.21	0.017	0.007	3	42.8	3	17	3.1	220
1	430575	04122255	8/6/2002	13.8	0.008 T	0.138 C	0.004	0.15	0.016	0.005	7	41.8	2	17.2	2.9	240
1	430575	04122255	10/7/2002	14.3	0.004 T	0.12 C	0.002	0.14	0.009	0.004	4	41.5	3	17.1	2.9	220
2	430578	04122330	5/15/2002	--	0.011	0.029 C	0.003	0.33	0.02	0.003	4	34.3	4	12.8	5.7	180
2	430578	04122330	6/25/2002	230	0.012	0.048 C	0.006	0.35 HT	0.031 HT	0.006 HT	7	38.1	6	14.6	4.2	210
2	430578	04122330	8/6/2002	199	0.006 T	0.047 C	0.002	0.19	0.023	0.01	8	39.1	8	14.9	2.8	220
2	430578	04122330	10/8/2002	191	0.027	0.078 C	0.002	0.28	0.02	0.007	5	40.3	6	14.9	2.8	210
3	430591	04122390	5/15/2002	472	0.011	0.03 C	0.002	0.37	0.024	0.005	11	37.6	7	12.9	5.3	200
3	430591	04122390	6/26/2002	332	0.012	0.039 C	0.006	0.32 HT	0.026 HT	0.007	15	41.5	10	14.6	3.1	230
3	430591	04122390	8/7/2002	265	0.008 T	0.032 C	0.003	0.22	0.02	0.01	19	42.2	11	14.6	2.7	240
3	430591	04122390	10/9/2002	269	0.049	0.089 C	0.003	0.19	0.022	0.009	13	41.3	17	14.9	2.6	230
4	430592	04122327	5/14/2002	80.2	0.013	0.019 C	0.002	0.39	0.021	0.01	7	31.5	2	11.3	7	160
4	430592	04122327	6/25/2002	85.7	0.023	0.055 C	0.003	0.38	0.041	0.01	8	39.1	5	13.8	4.3	200
4	430592	04122327	8/6/2002	60.8	0.016	0.06 C	0.003	0.24	0.025	0.013	10	35.3	4	13	3	200
4	430592	04122327	10/7/2002	66.7	0.015	0.057 C	0.002	0.18	0.013	0.006	7	39.3	4	13.8	3.2	200
5	530227	04122402	5/15/2002	23.2	0.013	0.016 C	0.004	0.51	0.021	0.002	6	43.7	2	14.1	8.3	210
5	530227	04122402	6/26/2002	11.5	0.036	0.031 C	0.008	0.71 HT	0.022 HT	0.004	6	45.8	2	15.2	9.5	220
5	530227	04122402	8/7/2002	2.2	0.019	0.059 C	0.003	0.36	0.009	0.002 T	7	46.3	3	16.6	6	220
5	530227	04122402	10/9/2002	3.19	0.019	0.04 C	0.002	0.58	0.024	0.005	4	46.3	3	16	7.2	230
6	530235	04122450	5/16/2002	414	0.016	0.068 C	0.003	0.66	0.039	0.012	7	34.4	7	11.7	11	180
6	530235	04122450	6/27/2002	163	0.023	0.17 C	0.01	0.49	0.045	0.01	14	42.7	13	14.4	7	230
6	530235	04122450	8/7/2002	108	0.005 T	0.007 C T	0.002	0.23	0.014	0.007	14	40.4	14	14.8	3.7	240
6	530235	04122450	10/9/2002	116	0.039	0.132 C	0.004	0.28	0.026	0.007	13	42.7	16	14.8	4.4	230
7	620248	04122435	5/15/2002	307	0.014	0.053 C	0.004	0.7	0.031	0.009	6	31.7	6	11	13	170
7	620248	04122435	6/26/2002	114	0.028	0.167 C	0.008	0.56	0.149	0.011	15	40.9	11	13.5	8	220
7	620248	04122435	8/7/2002	72.2	0.012	0.063 C	0.009	0.25	0.016	0.002 T	10	45.4	15	15.4	4	250
7	620248	04122435	10/9/2002	76.1	0.024	0.102 C	0.003	0.24	0.015	0.007	16	40.8	14	14.3	4.7	230
8	620249	04122280	5/14/2002	110	0.011	0.041 C	0.003	0.48	0.019	0.003	3	29.1	2	11.1	9.2	150
8	620249	0412280	6/25/2002	49.1	0.017	0.105 C	0.007	0.45 HT	0.037 HT	0.007 HT	4	37.7	2	15.1	4.3	200
8	620249	03297720	8/6/2002	41.3	0.005 T	0.08 C	0.002	0.19	0.01	0.005	7	40.5	3	15.6	3.2	200
8	620249	07007720	10/7/2002	42	0.009 T	0.11 C	0.002	0.19	0.009	0.002 T	5	38.8	3	15.3	3.3	200
9	530027	04122500	3/19/2002	--	0.013	0.102 C	0.003	0.35	0.022	0.008	12	31	9	11.1	6.7	170
9	530027	04122500	5/15/2002	1190	0.014	0.042 C	0.002	0.45	0.028	0.006	7	37	7	12.6	7.7	190
9	530027	04122500	6/26/2002	651	0.037	0.127 C	0.008	0.61 HT	0.064 HT	0.012	13	41.9	12	14.7	5	230
9	530027	04122500	8/7/2002	506	0.017	0.08 C	0.002	0.41	0.047	0.009	16	43.5	14	15.2	3.2	210
9	530027	04122500	10/9/2002	476	0.031	0.156 C	0.004	0.33	0.024	0.011	12	42	19	15.3	3.7	240

Codes for water quality values are listed in appendix A

Appendix B. Water-quality parameters for the Pere Marquette River watershed-Continued

[cfs, cubic feet per second; mg/L, milligram per liter; uS, microsiemens per centimeter; C, degrees celsius; NTU, nephelometric turbidity units]

Map Site No.	STORET ID	USGS Station No.	Sample Collection Date	Total Suspended Solids (mg/L)	Hardness CaCO ₃ (mg/L)	Conductivity (Lab) (umho/cm)	Conductivity (Field) (uS/cm)	Dissolved Oxygen (Field) (mg/L)	pH (Lab)	pH (Field)	Temperature of Water (C)	Turbidity (NTU)	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Sulfide (mg/L)	Total Alkalinity (mg CaCO ₃ /L)
1	430575	04122255	5/14/2002	7	141	272	208	9.9	8.06	8	11.7	1.8	2.7	0.7	--	119
1	430575	04122255	6/25/2002	4	177	334	282	10.2	8.05	7.9	14.2	1.7	2.7	0.6	0.02 K	155
1	430575	04122255	8/6/2002	12	175	339	296	9.6	8.19 HT	8.1	12.5	1 K	3.4	0.8	--	159
1	430575	04122255	10/7/2002	4 K	174	338	304	10.4	8.2	7.8	8.9	1 K	2.6	0.9	0.02 K	156
2	430578	04122330	5/15/2002	11	138	281	272	10.2	8.01	7.8	10	1.6	4.1	0.5	--	119
2	430578	04122330	6/25/2002	10	155	321	270	10.7	8.28 HT	8.2	20.4	3.4	4.7	0.6	0.02 K	137
2	430578	04122330	8/6/2002	4 K	159	320	279	10.4	8.52 HT	8.3	18	1 K	5.7	0.7	--	137
2	430578	04122330	10/8/2002	9	162	325	293	11.4	8.24	8.2	9.8	1 K HT	5.8	0.8	0.02 K	134
3	430591	04122390	5/15/2002	10	147	302	254	10	8.02	7.6	10	3	4.6	0.6	0.02 K	116
3	430591	04122390	6/26/2002	15	164	350	320	9.3	8.15 HT	8	19.8	3.4	7	0.6	--	136
3	430591	04122390	8/7/2002	19	166	351	298	9.3	8.32	8.2	16	2.3	7	0.6	--	143
3	430591	04122390	10/9/2002	7	165	353	325	10.7	8.17	8.1	10.3	2.1	7.7	3.3	0.02 K	135
4	430592	04122327	5/14/2002	6	125	252	242	10.2	7.86	8	9.5	2.6	2.5	0.4	0.02 K	104
4	430592	04122327	6/25/2002	8	155	303	296	8.24	7.91	7.99	17.1	4.1 HT	5.4	0.5	0.02 K	129
4	430592	04122327	8/6/2002	10	142	302	295	8.6	8.2 HT	8.1	15	2.3	5.1	0.6	0.02 K	128
4	430592	04122327	10/7/2002	4 K	155	305	315	9.9	8.13	7.9	8.9	1 K	3.1	0.6	0.02 K	131
5	530227	04122402	5/15/2002	5	167	319	313	10.5	8.15	8	10.5	1 K	1 K	0.6	--	143
5	530227	04122402	6/26/2002	4	177	337	337	6.82	7.87 HT	7.9	24.3	3.3	1.9	0.4	0.02 K	158
5	530227	04122402	8/7/2002	4 K	184	345	338	8.9	8.1	7.9	16.3	1 K	2.3	0.6	--	157
5	530227	04122402	10/9/2002	12	182	347	340	9.1	8.06	7.8	11.6	3	3	1	0.02 K	158
6	530235	04122450	5/16/2002	11	134	270	240	9.1	7.75	7.6	13.5	4.7	6.5	0.7	--	108
6	530235	04122450	6/27/2002	17	166	350	332	8.4	8.05	7.6	21.1	7.9	8.6	0.8	0.02 K	134
6	530235	04122450	8/7/2002	4 K	162	362	304	9.7	8.46	8.3	19.1	1.8	9.2	1.4	0.02 K	137
6	530235	04122450	10/9/2002	7	164	359	332	10.4	8.19	8.1	11.2	2.4	8.9	2.6	0.02 K	128
7	620248	04122435	5/15/2002	6	125	255	251	10	7.75	7.7	13.2	2.6	6.1	0.7	--	100
7	620248	04122435	6/26/2002	11	158	338	332	7.79	7.95 HT	8.01	21.5	5.6 HT	7.8	0.7	-- ST	136
7	620248	04122435	8/7/2002	5	177	389	390	7.7	8.38	8.2	21.4	2.3	9.9	1.1	0.02 K	157
7	620248	04122435	10/9/2002	6	161	357	350	10.5	8.1	7.9	10.8	1 K	9.1	2	0.02 K	125
8	620249	04122280	5/14/2002	5	118	230	222	11	8.02	8.3	12.7	1.5	1.9	0.5	--	106
8	620249	0412280	6/25/2002	11	156	306	301	9.52	8.24 HT	8.33	19.9	5.3	2.9	0.6	0.02 K	137
8	620249	03297720	8/6/2002	4 K	165	312	303	10.2	8.44 HT	8.4	15.8	1 K	3.6	0.7	--	141
8	620249	07007720	10/7/2002	4 K	160	311	308	11.2	8.31	8.1	9.5	1 K	3.5	0.8	0.02 K	141
9	530027	04122500	3/19/2002	4 K	123	262	237	12.4	7.71	7.4	3.3	3.3	3.7	0.9	0.02 K	102
9	530027	04122500	5/15/2002	7	144	294	248	9.6	7.8	7.6	11	3.7	5.4	0.7	--	115
9	530027	04122500	6/26/2002	28	165	357	328	7.2	7.92 HT	7.5	21.9	13	7.9	0.7	0.02 K	139
9	530027	04122500	8/7/2002	19 K	171	366	309	8.3	8.21	8.1	17.4	12	8.5	0.7	--	140
9	530027	04122500	10/9/2002	9	168	366	340	9.7	8.1	7.8	10.5	4	8.9	3.2	0.02 K	138

Codes for water quality values are listed in appendix A

Appendix C. Water-quality parameters for the Muskegon River watershed

[cfs, cubic feet per second; mg/L, milligram per liter; uS, microsiemens per centimeter; C, degrees celsius; NTU, nephelometric turbidity units]

Map Site No.	STORET ID	USGS Station No.	Sample Collection Date	Discharge (cfs)	Total Ammonia (mg/L)	Total Nitrate (mg/L)	Total Nitrite (mg/L)	Total Kjeldahl Nitrogen (mg/L)	Total Phosphorus (mg/L)	Total Ortho Phosphate (mg/L)	Total Sulfate (mg/L)	Total Calcium (mg/L)	Total Chloride (mg/L)	Total Magnesium (mg/L)	Total Organic Carbon (mg/L)	Total Dissolved Solids (mg/L)
10	180128	04121310	5/13/2002	192	0.008 T	0.72 C/HT	0.005 HT	0.43	0.02	0.007 HT	3	37.2	11	10.1	6.5	200
10	180128	04121310	6/24/2002	140	0.018	0.73 C	0.01	0.61	0.047	0.004	4	46.4	13	12.7	7.2	230
10	180128	04121310	8/5/2002	97.7	0.009 T	0.88 C	0.011	0.33	0.017	0.007	6	46.2	13	12.9	4	240
10	180128	04121310	10/7/2002	82.2	0.005 T	1.16 C	0.009	0.25	0.01	0.006	5	51.3	13	14.2	4	250
11	540034	04121650	5/16/2002	2100	0.028	0.179 C	0.003	0.52	0.038	0.006	5	37.6	11	11	8.2	190
11	540034	0412650	6/27/2002	1300	0.045	0.2 C	0.008	0.56	0.037	0.006	9	44.4	13	13.7	7.4	230
11	540034	03296350	8/8/2002	751	0.042	0.21 C	0.005	0.39	0.021	0.001 T	6	44.7	10	16.4	4.1	240
11	540034	07005350	10/10/2002	681	0.035	0.32 C	0.009	0.27	0.015	0.02	10	48.6	23	16.8	3.4	270
12	540137	04121855	5/17/2002	147	0.022 ST	0.41 C ST	0.004	0.46 ST	0.02 ST	0.007	4	40.1	8	13.3	39 ST	200
12	540137	04121855	6/27/2002	79.5	0.025	0.64 C	0.011	0.5	0.031	0.005	6	43.9	9	15.1	5.9	230
12	540137	04121855	8/8/2002	15.1	0.011	0.76 C	0.003	0.33	0.012	0.005	20	40.5	13	14.2	4.4	230
12	540137	04121855	10/10/2002	65.5	0.009 T	0.6 C	0.004	0.34	0.015	0.002 T	3	46	10	16.3	4.9	240
13	620250	04122000	5/16/2002	2960	0.021	0.38 C	0.007	0.42	0.021	0.006	8	40.9	15	12.8	7	210
13	620250	04122000	6/28/2002	1250	0.028	0.22 C	0.011	0.42	0.016	0.004	10	39.4	14	12.2	6.9	210
13	620250	04122000	8/8/2002	1170	0.013	0.158 C	0.01	0.36	0.012	0.005	13	42.1	20	14.8	5.9	230
13	620250	04122000	10/10/2002	1020	0.022	0.39 C	0.013	0.34	0.044	0.019	11	48	22	16.5	4.2	270
14	670222	04121365	5/13/2002	1320	0.013	0.136 C HT	0.002 HT	0.52	0.027	0.007 HT	3	29.9	9	8.3	9.6	160
14	670222	04121365	6/24/2002	702	0.014	0.34 C	0.008	0.64	0.059	0.007	5	42.2	11	11.3	8.1	200
14	670222	04121365	8/5/2002	365	0.009 T	0.2 C	0.005	0.37	0.022	0.009	10	42.3	12	11.8	5.1	220
14	670222	04121365	10/7/2002	293	0.007 T	0.34 C	0.004	0.23	0.013	0.008	8	48.7	13	13.8	3.5	240
15	720136	04120900	5/13/2002	247	0.007 T	NAV	0.001 T HT	0.59	0.023	0.008 HT	4	28.1	11	6.9	7.3	150
15	720136	04120900	6/24/2002	85.9	0.014	NAV	0.001 T	0.55	0.016	0.006	4	28.9	13	7.3	7.4	150
15	720136	04120900	8/5/2002	21.3	0.008 T	NAV	0.001 T	0.64	0.019	0.005	4	28.4	16	7.5	7.7	160
15	720136	04120900	10/7/2002	26.2	0.014	0.001 C T	0.002	0.73	0.024	0.004	3	30.8	14	8	7.6	170
16	610273	04122030	2/25/2002	--	0.019	0.5 C	0.005	0.32	0.019	0.007	16	42.5	19	13.6	5.6	240
16	610273	04122030	3/12/2002	--	0.041	0.56 C	0.005	0.38	0.032	0.008	10	39.4	18	12.7	5.5	230
16	610273	04122030	4/11/2002	--	0.024	0.46 C	0.006	0.37	0.02	0.006	11	35.3	17	11.2	7.2	200
16	610273	04122030	5/16/2002	3100	0.018	0.27 C	0.006	0.38	0.021	0.009	7	37.7	13	11.4	7	200
16	610273	04122030	6/27/2002	1310	0.015	0.21 C	0.009	0.4	0.019	0.003	10	38.6	14	12.4	6.9	210
16	610273	04122030	7/31/2002	--	0.017	0.26 C	0.007	0.36	0.015	0.005	14	39.9	21	14.4	6.1	250
16	610273	04122030	8/8/2002	1230	0.014	0.21 C	0.01	0.36	0.018	0.006	11	41.3	20	14	5.4	250
16	610273	04122030	10/10/2002	1070	0.016	0.39 C	0.005	0.32	0.036	0.001 T	3	48.8	23	16.6	4.2	260
16	610273	04122030	10/23/2002	--	0.019	0.35 C	0.007	0.26	0.025	0.014	16	48.8	21	16	4.1	270
16	610273	04122030	11/6/2002	--	0.013	0.38 C	0.007	0.25	0.018	0.009	18	49.7	22	17.1	4.2	280
16	610273	04122030	11/18/2002	--	0.013	0.45 C	0.006	0.25	0.006	0.006	10	57.2	26	14.2	4.6	280
16	610273	04122030	11/25/2002	--	0.013	0.42 C	0.006	0.24	0.014	0.008	20	47.6	22	16.8	5.5 HT	270
17	670008	04121621	3/20/2002	--	0.019	0.21 C	0.004	0.4	0.027	0.007	5	31	15	9.8	7.1	170
17	670008	04121621	5/14/2002	2200	0.018	0.183 C	0.004	0.47	0.03	0.008	4	33.9	13	10.9	8.1	190
17	670008	04121621	6/25/2002	1090	0.016	0.27 C	0.007	0.61	0.054	0.005	5	44.5	16	13.5	8.5 DM	230
17	670008	04121621	8/6/2002	653	0.011	0.165 C	0.001 T	0.38	0.032	0.008	10	45.6	15	14.1	4.8	230
17	670008	04121621	10/7/2002	535	0.011	0.29 C	0.004	0.33	0.015	0.004	7	48.4	19	15.4	4.6	260

Codes for water quality values are listed in appendix A

Appendix C. Water-quality parameters for the Muskegon River watershed-Continued

(cfs, cubic feet per second; mg/L, milligram per liter; uS, microsiemens per centimeter; C, degrees celsius; NTU, nephelometric turbidity units)

Map Site No.	STORET ID	USGS Station No.	Sample Collection Date	Total Suspended Solids (mg/L)	Hardness Ca2CO3 (mg/L)	Conductivity (Lab) (umho/cm)	Conductivity (Field) (uS/cm)	Dissolved Oxygen (Field) (mg/L)	pH (Lab)	pH (Field)	Temperature of Water (C)	Turbidity (NTU)	Total Sodium (mg/L)	Total Potassium (mg/L)	Total Sulfide (mg/L)	Total Alkalinity (mg CaCO3/L)
10	180128	04121310	5/13/2002	6	135	305	245	11	8	7.7	8.7	3.5 HT	7.3	1.4	0.02 K	114
10	180128	04121310	6/24/2002	17	168	352	331	8.6	8.08 HT	8.1	21.9	9.3	8.6	1.8	0.02 K	142
10	180128	04121310	8/5/2002	7	169	362	338	9.5	8.46	8.4	20.7	4.4	7.7	1.8	--	144
10	180128	04121310	10/7/2002	4 K	187	384	341	10.7	8.31	8.2	10.2	2.6	7.5	2.1	0.02 K	154
11	540034	04121650	5/16/2002	10	139	291	289	8.9	7.88	7.7	13.9	5.4	7.1	0.9	--	110
11	540034	0412650	6/27/2002	10	167	356	361	7.34	8.18	8.28	24.9	4.4 HT	9.1	1	0.02 K	145
11	540034	03296350	8/8/2002	4 K	179	370	361	11.1	8.44	8.3	19.6	1 K	4.8	0.6	0.02 K	160
11	540034	07005350	10/10/2002	5	191	415	393	9.7	8.27	8.2	15.8	2.1	12	1.4	0.02 K	147
12	540137	04121855	5/17/2002	4 K	155	308	267	9.8	7.8	7.6	9.6	1 K	5.9	0.6	--	124
12	540137	04121855	6/27/2002	9	172	353	335	9.19	8.25	8.31	21.9	3.6 HT	4.9	0.6	0.02 K	152
12	540137	04121855	8/8/2002	4 K	160	358	353	9.9	8.33	8.15	18.1	1.6	8.7	0.8	0.02 K	135
12	540137	04121855	10/10/2002	4 K	182	363	360	11.8	8.31	8.1	12.7	1 K	5.3	0.8	0.02 K	149
13	620250	04122000	5/16/2002	4	155	326	321	10	7.97	7.8	12.5	2.3	8.7	1.1	--	119
13	620250	04122000	6/28/2002	4 K	149	330	258	9.8	7.84	7.6	19	1 K	8.6	1	0.02 K	123
13	620250	04122000	8/8/2002	4 K	166	378	353	10.1	8.35	8.2	22.2	1 K	10.2	1	0.02 K	137
13	620250	04122000	10/10/2002	8	188	410	389	9.1	8.13	7.9	14.8	1.8	11.9	1.7	0.02 K	143
14	670222	04121365	5/13/2002	5	109	244	196	9.9	7.74	7.7	10.2	3.8 HT	7.1	0.8	0.02 K	90
14	670222	04121365	6/24/2002	19	152	310	290	7.2	7.95 HT	7.7	22.4	9.7	7.9	1.1	0.02 K	119
14	670222	04121365	8/5/2002	11	7.85	345	310	7.7	8.19	8.1	21.4	2.7	7.8	1.1	--	130
14	670222	04121365	10/7/2002	4 K	179	375	331	10	8.25	8	10.2	2.3	7.9	1.3	0.02 K	146
15	720136	04120900	5/13/2002	9	99	230	220	10.7	7.89	7.6	9.7	5.3 HT	8.1	0.6	0.02 K	79
15	720136	04120900	6/24/2002	4 K	102	235	233	8.2	8.07	8	26.3	2	8.6	0.6	0.02 K	83
15	720136	04120900	8/5/2002	7	102	249	245	8.2	8.61 HT	8.6	26.1	2.8	8.8	1.7	0.02 K	87
15	720136	04120900	10/7/2002	5	110	257	249	9.8	8.29	7.9	11.9	4.9	8.5	0.9	0.02 K	92
16	610273	04122030	2/25/2002	14 A	162	373	342	12.6	7.85	7.7	2.4	2.6	10.1	1.1	--	127
16	610273	04122030	3/12/2002	12	151	357	300	13.1	7.95	7.6	0.8	8.3	10.5	1.2	--	126
16	610273	04122030	4/11/2002	10	134	310	272	11.8	7.83	7.7	4.7	3.1	8	1.3	--	109
16	610273	04122030	5/16/2002	7	141	305	275	10	7.81	7.8	12	2.6	7.3	1.1	--	109
16	610273	04122030	6/27/2002	6	148	325	309	9.3	7.96	7.8	21.6	2.4	8.6	1	0.02 K	120
16	610273	04122030	7/31/2002	7	159	377	353	7.6	8.14	7.9	23.6	2.7 QC	9.9	1.1	--	136
16	610273	04122030	8/8/2002	6	161	358	331	--	8.32	8.2	22.7	2.6	9.5	1	--	130
16	610273	04122030	10/10/2002	5 K	190	404	403	10.8	8.42	8.3	13	1 K	9.8	1.3	0.02 K	162
16	610273	04122030	10/23/2002	6	188	414	387	10.3	8.26	8.2	10.3	1 K	11.2	1.2	--	154
16	610273	04122030	11/6/2002	4 K	188	420	390	12.7	8.28	8.2	6.7	1 K	12.1	1.2	--	153
16	610273	04122030	11/18/2002	4 K	195	424	389	11.7	8.22 HT	7.8	2	1 K	9.1	1.6	--	186
16	610273	04122030	11/25/2002	4	201	417	386	13	8.32	8.2	4.4	1 K HT	12.5	1.2	--	156
17	670008	04121621	3/20/2002	10	118	266	238	12.6	7.75	7.3	3.1	3.7	8.2	1.2	0.02 K	92
17	670008	04121621	5/14/2002	10	130	297	222	10	7.92	7.6	10	4	8.6	1	0.02 K	108
17	670008	04121621	6/25/2002	21	167	354	299	7.7	7.96	7.7	21.3	10	10.8	1.1	0.02 K	138
17	670008	04121621	8/6/2002	12	172	370	323	8.1	8.23 HT	7.7	19.2	7	9.4	1.1	--	146
17	670008	04121621	10/7/2002	4 K	184	400	362	9.9	8.23	8	9.7	2	10	1.4	0.02 K	160

Codes for water quality values are listed in appendix A

Appendix D. Mercury dData for the Pere Marquette River and Muskegon River watersheds

[ng/L, nanograms per liter; K, concentration below quantification level shown; HT, recommended laboratory holding time was exceeded before analysis; MS, Matrix spike exceeded quality control criteria]

Pere Marquette River					Muskegon River				
Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	Mercury (ng/L)	Map Site Number	STORET ID	USGS Station No.	Sample Collection Date	Mercury (ng/L)
1	430575	04122255	5/14/2002	1.6	10	180128	04122255	5/13/2002	1.6
1	430575	04122255	6/25/2002	0.5	10	180128	04122255	6/24/2002	2.3
1	430575	04122255	8/6/2002	0.5 K	10	180128	04122255	8/5/2002	0.7
1	430575	04122255	10/7/2002	0.5 K	10	180128	04122255	10/7/2002	0.5 K
2	430578	04122330	5/15/2002	1.4	11	540034	04121650	5/16/2002	1.4
2	430578	04122330	6/25/2002	1.6	11	540034	04121650	6/27/2002	1.2
2	430578	04122330	8/6/2002	0.8	11	540034	04121650	8/8/2002	0.5
2	430578	04122330	10/8/2002	0.9 HT	11	540034	04121650	10/10/2002	0.5 K
3	430591	04122390	5/14/2002	1.5	12	540137	04121855	5/16/2002	1.1
3	430591	04122390	6/26/2002	1.3	12	540137	04121855	6/27/2002	1.2
3	430591	04122390	8/7/2002	0.7	12	540137	04121855	8/8/2002	0.6
3	430591	04122390	10/9/2002	0.8	12	540137	04121855	10/10/2002	0.5 K
4	430592	04122327	5/13/2002	2.1	13	620250	04122000	5/16/2002	1
4	430592	04122327	6/25/2002	1.9	13	620250	04122000	6/28/2002	0.6
4	430592	04122327	8/6/2002	1	13	620250	04122000	8/8/2002	0.5
4	430592	04122327	10/7/2002	0.6	13	620250	04122000	10/10/2002	0.5 K
5	530227	04122402	5/15/2002	1.2	14	670222	04121365	5/13/2002	2.2
5	530227	04122402	6/26/2002	1	14	670222	04121365	6/24/2002	2.5
5	530227	04122402	8/7/2002	0.5 K	14	670222	04121365	8/5/2002	0.9
5	530227	04122402	10/9/2002	0.8	14	670222	04121365	10/7/2002	0.5 K
6	530235	04122450	5/16/2002	2.4	15	720136	04120900	5/13/2002	1.3
6	530235	04122450	6/27/2002	1.6	15	720136	04120900	6/24/2002	0.7
6	530235	04122450	07-Aug-02	0.6	15	720136	04120900	8/5/2002	0.5 K
6	530235	04122450	10/9/2002	1	15	720136	04120900	10/7/2002	0.8
7	620248	04122435	5/15/2002	2.1	16	610273	04122030	2/25/2002	0.88
7	620248	04122435	6/27/2002	1.8	16	610273	04122030	3/12/2002	1.51
7	620248	04122435	8/7/2002	0.6	16	610273	04122030	4/11/2002	1.48
7	620248	04122435	10/9/2002	0.6	16	610273	04122030	5/16/2002	1.44
8	620249	04122280	5/14/2002	2.2	16	610273	04122030	6/27/2002	0.75
8	620249	04122280	6/25/2002	1.7	16	610273	04122030	7/31/2002	0.36 MS
8	620249	04122280	8/6/2002	0.9	16	610273	04122030	8/8/2002	0.51 MS
8	620249	04122280	10/7/2002	0.7	16	610273	04122030	10/10/2002	0.48
9	530027	04122500	3/19/2002	1.53	16	610273	04122030	10/23/2002	0.31
9	530027	04122500	5/15/2002	1.84	16	610273	04122030	11/18/2002	0.3
9	530027	04122500	6/26/2002	3	16	610273	04122030	11/25/2002	0.23
9	530027	04122500	8/7/2002	1.43 MS	16	610273	04122030	11/6/2002	0.42
9	530027	04122500	10/9/2002	0.94	17	670008	04121621	3/20/2002	2.06
					17	670008	04121621	5/14/2002	1.64
					17	670008	04121621	6/25/2002	1.75
					17	670008	04121621	8/6/2002	0.8 MS
					17	670008	04121621	10/8/2002	0.66

Appendix E. Trace metal data for the Pere Marquette River and Muskegon River watersheds sediment samples

[mg/kg, milligram per kilogram; K, concentration below quantification level shown]

Map Site Number	STORET ID	Sample Collection Date	Percent Solids	Lead mg/kg dry weight	Zinc mg/kg dry weight	Chromium mg/kg dry weight	Cadmium mg/kg dry weight	Barium mg/kg dry weight	Selenium mg/kg dry weight	Mercury mg/kg dry weight	Arsenic mg/kg dry weight	Silver mg/kg dry weight	Copper mg/kg dry weight
Pere Marquette River Watershed													
1	430575	8/6/2002	52%	5 K	13	3	2 K	20	0.5 K	0.05 K	1.3	0.25 K	3
2	430578	8/6/2002	23%	9	34	8	2 K	37	0.9	0.2 K	3.4	0.25 K	6
3	430591	8/7/2002	43%	5 K	14	4	2 K	23	0.5 K	0.1 K	2.1	0.25 K	4
4	430592	8/6/2002	36%	6	20	4	2 K	27	0.5 K	0.15 K	1.6	0.25 K	4
5	530227	8/7/2002	56%	5 K	12	4	2 K	8	0.5 K	0.05 K	0.6	0.25 K	3
6	530235	8/7/2002	55%	6	19	5	2 K	26	0.5 K	0.05 K	1.7	0.25 K	4
7	620248	8/7/2002	28%	9	37	6	2 K	61	0.5 K	0.2 K	4	0.25 K	7
8	620249	8/6/2002	40%	5 K	21	5	2 K	31	0.5 K	0.1 K	2	0.25 K	4
9	530027	8/7/2002	32%	9	31	8	2 K	36	0.5 K	0.15 K	2.1	0.25 K	7
Muskegon River Watershed													
10	180128	8/5/2002	26%	7	37	10	2 K	47	0.6	0.2 K	6.5	0.25 K	10
11	540034	8/8/2002	63%	5 K	17	2	2 K	9	0.5 K	0.05 K	1.2	0.25 K	3
12	540137	8/8/2002	77%	5 K	20	2	2 K	6	0.5 K	0.05 K	0.5 K	0.25 K	4
13	620250	8/8/2002	72%	5	12	3	2 K	12	0.5 K	0.05 K	0.8	0.25 K	3
14	670222	8/5/2002	53%	5 K	18	4	2 K	22	0.5 K	0.05 K	1.9	0.25 K	4
15	720136	8/5/2002	14%	71	104	17	2 K	73	1.2	0.4 K	11.9	0.25 K	148
16	610273	8/8/2002	57%	5 K	17	5	2 K	17	0.5 K	0.05 K	1.4	0.25 K	4
17	670008	8/6/2002	48%	6	26	5	2 K	37	0.5 K	0.1 K	3.6	0.25 K	5