

**Appendix A-1.** Method Detection Limits (Limits of Detection) and Reporting Limits (Limits of Quantification) for WCMP and PROB Site Data. Methods were by the USEPA unless otherwise noted (e.g., Standard Methods [SM] [APHA et al. (1995)]).

|                                            |                          |              |             |           |           |                                     |                                    |                                                                    | Parameter Sampled<br>During Some of<br>the Listed Years |       |      |                |
|--------------------------------------------|--------------------------|--------------|-------------|-----------|-----------|-------------------------------------|------------------------------------|--------------------------------------------------------------------|---------------------------------------------------------|-------|------|----------------|
| Parameter                                  | Laboratory<br>(or Field) | LOD<br>(MDL) | LOQ<br>(RL) | Units     | YEARS     | Method #<br>(from Aiello<br>[2008]) | Method #<br>(from Roush<br>[2013]) | Method #<br>(from 2014/2016<br>MDEQ lab reports<br>or WSLH [*,**]) | PROB                                                    | Tribs | Bays | Conn.<br>Chan. |
| Conductance, Specific                      | Field                    | ---          | ---         | umhos/cm  | 1998-2014 | Field Probe                         | Field Probe                        | Field Probe                                                        | ✓                                                       | ✓     | ✓    | ✓              |
| Oxygen, Dissolved                          | Field                    | ---          | ---         | mg/L      | 1998-2014 | Field Probe                         | Field Probe                        | Field Probe                                                        | ✓                                                       | ✓     | ✓    | ✓              |
| pH                                         | Field                    | ---          | ---         | Std Units | 1998-2014 | Field Probe                         | Field Probe                        | Field Probe                                                        | ✓                                                       | ✓     | ✓    | ✓              |
| Temperature                                | Field                    | ---          | ---         | °C        | 1998-2014 | Field Probe                         | Field Probe                        | Field Probe                                                        | ✓                                                       | ✓     | ✓    | ✓              |
| Alkalinity (Total) (as CaCO <sub>3</sub> ) | MDEQ Env Lab             | 13           | 20          | mg/L      | 1998-2014 | 310.2                               | 310.2                              | 310.2                                                              |                                                         | ✓     | ✓    | ✓              |
| Ammonia (Total) (as N)                     | MDEQ Env Lab             | 0.001        | 0.010       | mg/L      | 1998-2014 | 350.1                               | 350.1                              | 350.1                                                              |                                                         | ✓     | ✓    | ✓              |
| Calcium                                    | MDEQ Env Lab             | 1            | 1           | mg/L      | 1998-2014 | 7140/<br>215.1<br>***               | 7140/<br>3111B [SM]                | 6010/<br>200.7                                                     | ✓                                                       | ✓     | ✓    | ✓              |
| Carbon, Dissolved Organic §                | MDEQ Env Lab             | 0.5          | 0.5         | mg/L      | 1998-2014 | not done                            | 5310C [SM]                         | 5310 C [SM]                                                        | ✓                                                       |       |      |                |
| Carbon, Total Organic                      | MDEQ Env Lab             | 0.5          | 0.5         | mg/L      | 1998-2014 | 415.1                               | 415.1                              | 5310 C [SM]                                                        |                                                         | ✓     | ✓    | ✓              |
| Chloride                                   | MDEQ Env Lab             | 0.05         | 1           | mg/L      | 1998-2014 | 325.2                               | 325.2                              | 325.2                                                              | ✓                                                       | ✓     | ✓    | ✓              |
| Chlorophyll-a                              | MDEQ Env Lab             | 1            | 1           | µg/L      | 1998-2014 |                                     | 10200 H [SM]<br>***                | 10200 H [SM]<br>(2014 lab report);<br>445.0 (2016 lab<br>report)   |                                                         |       | ✓    |                |
| Hardness (Calc.) (as CaCO <sub>3</sub> )   | MDEQ Env Lab             | N/A          | 5           | mg/L      | 1998-2014 | Calculated                          | Calculated                         | Calculated<br>(2340 B) [SM]                                        | ✓                                                       | ✓     | ✓    | ✓              |
| Magnesium                                  | MDEQ Env Lab             | 0.5          | 1           | mg/L      | 1998-2014 | 7450/<br>242.1<br>***               | 7450/<br>242.1                     | 6010/<br>200.7                                                     | ✓                                                       | ✓     | ✓    | ✓              |
| Nitrate (Total) (Calc.) (as N)             | MDEQ Env Lab             | 0.001        | 0.010       | mg/L      | 1998-2014 | 353.2                               | 353.2                              | 353.2                                                              |                                                         | ✓     | ✓    | ✓              |
| Nitrite (Total) (as N)                     | MDEQ Env Lab             | 0.002        | 0.010       | mg/L      | 1998-2014 | 353.3                               | 353.3                              | 353.2                                                              |                                                         | ✓     | ✓    | ✓              |
| Nitrogen, Total Kjeldahl (as N)            | MDEQ Env Lab             | 0.040        | 0.100       | mg/L      | 1998-2014 | 351.2                               | 351.2                              | 351.2                                                              |                                                         | ✓     | ✓    | ✓              |
| Orthophosphate (Total) (as P)              | MDEQ Env Lab             | 0.002        | 0.005       | mg/L      | 1998-2014 | 365.1                               | 365.1                              | 365.1                                                              |                                                         | ✓     | ✓    | ✓              |

| <u>Parameter</u>                | <u>Laboratory<br/>(or Field)</u> | <u>LOD<br/>(MDL)</u> | <u>LOQ<br/>(RL)</u> | <u>Units</u> | <u>YEARS</u> | <u>Method #<br/>(from Aiello<br/>[2008])</u> | <u>Method #<br/>(from Roush<br/>[2013])</u> | <u>Method #<br/>(from 2014/2016<br/>MDEQ lab reports<br/>or WSLH [*,**])</u> | <u>PROB</u> | <u>Tribs</u> | <u>Bays</u> | <u>Conn.<br/>Chan.</u> |
|---------------------------------|----------------------------------|----------------------|---------------------|--------------|--------------|----------------------------------------------|---------------------------------------------|------------------------------------------------------------------------------|-------------|--------------|-------------|------------------------|
| Phosphorus (Total) (as P)       | MDEQ Env Lab                     | 0.003                | 0.005               | mg/L         | 1998-2014    | 365.4                                        | 365.4                                       | 365.4                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Potassium                       | MDEQ Env Lab                     | 0.1                  | 0.1                 | mg/L         | 1998-2014    | 7610/<br>258.1                               | 7610/<br>258.1                              | 6010/<br>200.7                                                               |             | ✓            | ✓           | ✓                      |
| Sodium                          | MDEQ Env Lab                     | 1                    | 1                   | mg/L         | 1998-2014    | 7770/<br>273.1                               | 7770/<br>273.1                              | 6010/<br>200.7                                                               |             | ✓            | ✓           | ✓                      |
| Solids, Total Dissolved (Calc.) | MDEQ Env Lab                     | 20                   | 20                  | mg/L         | 1998-2014    | Calculated                                   | Calculated                                  | Calculated                                                                   |             | ✓            | ✓           | ✓                      |
| Solids, Total Suspended         | MDEQ Env Lab                     | 1                    | 4                   | mg/L         | 1998-2014    | 160.2                                        | 2540 D [SM]                                 | 2540 D [SM]                                                                  | ✓           | ✓            | ✓           | ✓                      |
| Sulfate                         | MDEQ Env Lab                     | 0.6                  | 2                   | mg/L         | 1998-2014    | 375.2                                        | 375.2                                       | 375.2                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Turbidity                       | MDEQ Env Lab                     | 1                    | 1                   | NTU          | 1998-2014    | 180.1                                        | 180.1                                       | 180.1                                                                        |             | ✓            | ✓           | ✓                      |
| Lead (Total)                    | WSLH                             | 0.0041               | 0.014               | µg/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Lead (Total)                    | WSLH                             | 0.0050               | 0.015               | µg/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Lead (Total)                    | UMAQL                            | 0.0054               | 0.017               | µg/L         | 1999         | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Chromium (Total)                | WSLH                             | 0.057                | 0.190               | µg/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Chromium (Total)                | WSLH                             | 0.020                | 0.060               | µg/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Chromium (Total)                | UMAQL                            | 0.027                | 0.086               | µg/L         | 1998-1999    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Copper (Total)                  | WSLH                             | 0.03                 | 0.10                | µg/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Copper (Total)                  | WSLH                             | 0.01                 | 0.04                | µg/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Copper (Total)                  | UMAQL                            | 0.18                 | 0.57                | µg/L         | 1999         | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ✓            | ✓           | ✓                      |
| Mercury (Total) φ               | MDEQ Env Lab                     | 0.04 - 0.28          | 0.5                 | ng/L         | 2005-2014    | 1631**                                       | 1631**                                      | 1631**                                                                       | ✓           | ✓            | ✓           | ✓                      |
| Mercury (Total)                 | WSLH                             | 0.14                 | 0.45                | ng/L         | 2002-2014    | 1631**                                       | 1631**                                      | 1631**                                                                       | ✓           | ✓            | ✓           | ✓                      |
| Mercury (Total)                 | WSLH                             | 0.10                 | 0.30                | ng/L         | 2000-2001    | 1631**                                       | 1631**                                      | 1631**                                                                       | ✓           | ✓            | ✓           | ✓                      |
| Mercury (Total)                 | UMAQL                            | 0.13                 | 0.41                | ng/L         | 1998-1999    | 1631**                                       | 1631**                                      | 1631**                                                                       | ✓           | ✓            | ✓           | ✓                      |
| Nickel                          | WSLH                             | 0.093                | 0.310               | ng/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ‡            | ‡           | ‡                      |
| Nickel                          | WSLH                             | 0.09                 | 0.30                | ng/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |
| Nickel                          | UMAQL                            | 0.023                | 0.073               | ng/L         | 1998-1999    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |
| Zinc                            | WSLH                             | 0.13                 | 0.43                | ng/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ‡            | ‡           | ‡                      |
| Zinc                            | WSLH                             | 0.04                 | 0.13                | ng/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |
| Zinc                            | UMAQL                            | 0.056                | 0.180               | ng/L         | 1998-1999    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |
| Cadmium                         | WSLH                             | 0.011                | 0.037               | ng/L         | 2002-2014    | 1638*                                        | 1638*                                       | 1638*                                                                        | ✓           | ‡            | ‡           | ‡                      |
| Cadmium                         | WSLH                             | 0.01                 | 0.03                | ng/L         | 2000-2001    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |
| Cadmium                         | UMAQL                            | 0.0098               | 0.0310              | ng/L         | 1998-1999    | 1638*                                        | 1638*                                       | 1638*                                                                        |             | ✓            | ✓           | ✓                      |

| <u>Parameter</u> | <u>Laboratory</u><br><u>(or Field)</u> | <u>LOD</u><br><u>(MDL)</u> | <u>LOQ</u><br><u>(RL)</u> | <u>Units</u> | <u>YEARS</u> | <u>Method #</u><br><u>(from Aiello</u><br><u>[2008])</u> | <u>Method #</u><br><u>(from Roush</u><br><u>[2013])</u> | <u>Method #</u><br><u>(from 2014/2016</u><br><u>MDEQ lab reports</u><br><u>or WSLH [*,**])</u> | <u>PROB</u> | <u>Tribs</u> | <u>Bays</u> | <u>Conn.</u><br><u>Chan.</u> |
|------------------|----------------------------------------|----------------------------|---------------------------|--------------|--------------|----------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------|--------------|-------------|------------------------------|
|------------------|----------------------------------------|----------------------------|---------------------------|--------------|--------------|----------------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------|-------------|--------------|-------------|------------------------------|

**NOTES:**

*Details regarding **PCBs** and **pesticides** sampled through 2007 (e.g., field and laboratory methods, analytical detection and quantification levels) can be found in Aiello (2008).*

\* Method consistent with USEPA Method 1638. (Refer also to the WSLH ESS's INO Method 400.4 [revision 8, 5/2015].)

\*\* Method consistent with USEPA Method 1631. (Refer also to the WSLH ESS's INO Method 541.1 [revision 8, 6/28/2016].)

\*\*\* Not specifically listed in Aiello (2008), but listed in the MDEQ's WCMP QAPP (2007) and/or a MDEQ Lab report from that time period.

‡ Most analyses of cadmium, nickel, and zinc ended at these sites in 2005.

§ Dissolved organic carbon samples were filtered after reception by the lab, not in the field.

φ MDLs for Hg were 0.18 (2006), 0.10 (2007), 0.13 (2008), 0.18 (2009), 0.28 (2010), 0.27 (2011), 0.05 (2012), 0.10 (2013), 0.04 (2014), and 0.09 ng/L (2015).

Calc. = Calculated (e.g., *hardness* is computed from the separate determinations of calcium and magnesium).

NTU = Nephelometric Turbidity Units.

umhos/cm =  $\mu\text{S}/\text{cm}$

**Appendix A-2.** Michigan's Level III Ecoregions and the abbreviations used in this report. Refer to Roush (2013), USEPA (2010), and Omernik and Gallant (1988) for more information including detailed descriptions of these ecoregions and their corresponding hydrology.

| <b>Common Abbreviation</b> | <b>Alternative, Shorter Abbreviations in some Parts of this Report</b> | <b>Full Ecoregion Name</b>                        |
|----------------------------|------------------------------------------------------------------------|---------------------------------------------------|
| ECBP                       | EC                                                                     | Eastern Corn Belt Plains                          |
| HELP                       | HE                                                                     | Huron / Erie Lake Plains                          |
| NCHF                       | NC                                                                     | North Central Hardwood Forests                    |
| NLAF                       | NL                                                                     | Northern Lakes and Forests                        |
| SMNIDP                     | SM, SMNI                                                               | Southern Michigan / Northern Indiana Drift Plains |

Appendix A-3. Loading Estimates for the WCMP Great Lakes Tributaries, 2001 - 2013; in order by STORET, parameter, and then year. Kg/year = kilograms per year; cfs = cubic feet per second.

| YEAR | STORET ID | Waterbody Name        | Parameter | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-----------------------|-----------|---------------|-------------------------|------------------------|------|
| 2001 | 030077    | lower Kalamazoo River | Chloride  | 93,663,356.00 | 7%                      | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Chloride  | 61,598,921.00 | 10%                     | 1270                   |      |
| 2003 | 030077    | lower Kalamazoo River | Chloride  | 62,190,203.00 | 7%                      | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Chloride  | 73,825,286.00 | 11%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Chloride  | 71,500,000.00 | 6%                      | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Chloride  | 77,000,000.00 | 8%                      | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Chloride  | 70,900,000.00 | 5%                      | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Chloride  | 93,600,000.00 | 10%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Chloride  | 87,900,000.00 | 13%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Chloride  | 80,600,000.00 | 9%                      | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Chloride  | 82,722,593.00 | 9%                      | 2668                   |      |
| 2012 | 030077    | lower Kalamazoo River | Chloride  | 61,549,062.00 | 5%                      | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Chloride  | 78,950,595.00 | 8%                      | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | Chromium  | 1,907.00      | 11%                     | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Chromium  | 839.00        | 47%                     | 1720                   |      |
| 2003 | 030077    | lower Kalamazoo River | Chromium  | 855.00        | 18%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Chromium  | 1,067.00      | 26%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Chromium  | 380.00        | 24%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Chromium  | 1,450.00      | 34%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Chromium  | 2,150.00      | 21%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Chromium  | 2,550.00      | 21%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Chromium  | 2,340.00      | 19%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Chromium  | 2,660.00      | 88%                     | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Chromium  | 2,478.00      | 31%                     | 2668                   |      |
| 2012 | 030077    | lower Kalamazoo River | Chromium  | 1,113.25      | 18%                     | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Chromium  | 1,697.00      | 22%                     | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | Copper    | 4,745.00      | 11%                     | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Copper    | 2,117.00      | 22%                     | 1720                   |      |
| 2003 | 030077    | lower Kalamazoo River | Copper    | 2,325.00      | 13%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Copper    | 3,051.00      | 10%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Copper    | 2,080.00      | 17%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Copper    | 2,840.00      | 10%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Copper    | 2,490.00      | 11%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Copper    | 4,200.00      | 17%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Copper    | 4,310.00      | 10%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Copper    | 3,950.00      | 38%                     | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Copper    | 4,088.00      | 11%                     | 2668                   |      |

| YEAR | STORET ID | Waterbody Name        | Parameter  | Mean kg/year | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-----------------------|------------|--------------|-------------------------|------------------------|------|
| 2012 | 030077    | lower Kalamazoo River | Copper     | 1,849.00     | 6%                      | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Copper     | 3,019.00     | 8%                      | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | Lead       | 3,678.00     | 9%                      | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Lead       | 1,752.00     | 25%                     | 1720                   |      |
| 2003 | 030077    | lower Kalamazoo River | Lead       | 1,994.00     | 13%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Lead       | 2,384.00     | 14%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Lead       | 1,690.00     | 22%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Lead       | 2,120.00     | 22%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Lead       | 2,080.00     | 29%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Lead       | 3,950.00     | 32%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Lead       | 3,160.00     | 8%                      | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Lead       | 3,760.00     | 78%                     | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Lead       | 3,442.00     | 26%                     | 2668                   |      |
| 2012 | 030077    | lower Kalamazoo River | Lead       | 1,606.00     | 20%                     | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Lead       | 2,358.00     | 13%                     | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | Mercury    | 13.00        | 19%                     | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Mercury    | 6.21         | 13%                     | 1270                   |      |
| 2003 | 030077    | lower Kalamazoo River | Mercury    | 9.00         | 16%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Mercury    | 10.30        | 12%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Mercury    | 6.91         | 14%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Mercury    | 9.81         | 26%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Mercury    | 9.18         | 36%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Mercury    | 14.10        | 9%                      | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Mercury    | 14.60        | 12%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Mercury    | 13.60        | 25%                     | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Mercury    | 14.20        | 16%                     | 2668                   |      |
| 2012 | 030077    | lower Kalamazoo River | Mercury    | 8.40         | 28%                     | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Mercury    | 12.00        | 12%                     | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | Phosphorus | 273,020.00   | 19%                     | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | Phosphorus | 202,178.00   | 95%                     | 1270                   |      |
| 2003 | 030077    | lower Kalamazoo River | Phosphorus | 151,406.00   | 24%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | Phosphorus | 162,133.00   | 14%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | Phosphorus | 110,000.00   | 29%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | Phosphorus | 145,000.00   | 19%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | Phosphorus | 130,000.00   | 19%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | Phosphorus | 228,000.00   | 35%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | Phosphorus | 235,000.00   | 19%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | Phosphorus | 237,000.00   | 52%                     | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | Phosphorus | 241,265.00   | 44%                     | 2668                   |      |

| YEAR | STORET ID | Waterbody Name        | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-----------------------|------------|----------------|-------------------------|------------------------|------|
| 2012 | 030077    | lower Kalamazoo River | Phosphorus | 93,805.00      | 15%                     | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | Phosphorus | 156,220.00     | 11%                     | 2251                   |      |
| 2001 | 030077    | lower Kalamazoo River | TSS        | 51,900,472.00  | 14%                     | 2780                   |      |
| 2002 | 030077    | lower Kalamazoo River | TSS        | 22,477,575.00  | 27%                     | 1270                   |      |
| 2003 | 030077    | lower Kalamazoo River | TSS        | 33,002,159.00  | 18%                     | 1560                   |      |
| 2004 | 030077    | lower Kalamazoo River | TSS        | 30,989,230.00  | 28%                     | 2140                   |      |
| 2005 | 030077    | lower Kalamazoo River | TSS        | 29,000,000.00  | 47%                     | 1613                   |      |
| 2006 | 030077    | lower Kalamazoo River | TSS        | 31,600,000.00  | 29%                     | 2050                   |      |
| 2007 | 030077    | lower Kalamazoo River | TSS        | 33,800,000.00  | 27%                     | 2010                   |      |
| 2008 | 030077    | lower Kalamazoo River | TSS        | 37,100,000.00  | 17%                     | 2850                   |      |
| 2009 | 030077    | lower Kalamazoo River | TSS        | 33,000,000.00  | 23%                     | 3093                   |      |
| 2010 | 030077    | lower Kalamazoo River | TSS        | 80,900,000.00  | 138%                    | 2572                   |      |
| 2011 | 030077    | lower Kalamazoo River | TSS        | 49,050,890.00  | 34%                     | 2668                   |      |
| 2012 | 030077    | lower Kalamazoo River | TSS        | 23,754,059.00  | 38%                     | 1605                   |      |
| 2013 | 030077    | lower Kalamazoo River | TSS        | 35,813,070.00  | 14%                     | 2251                   |      |
| 2005 | 040123    | Thunder Bay River     | Chloride   | 4,140,000.00   | 12%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Chloride   | 4,420,000.00   | 4%                      | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | Chromium   | 40.90          | 89%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Chromium   | 117.00         | 44%                     | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | Copper     | 310.00         | 19%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Copper     | 257.00         | 9%                      | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | Lead       | 67.70          | 28%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Lead       | 47.00          | 16%                     | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | Mercury    | 0.77           | 57%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Mercury    | 0.57           | 30%                     | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | Phosphorus | 11,900.00      | 29%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | Phosphorus | 11,200.00      | 19%                     | 675                    |      |
| 2005 | 040123    | Thunder Bay River     | TSS        | 2,060,000.00   | 22%                     | 671                    |      |
| 2010 | 040123    | Thunder Bay River     | TSS        | 1,430,000.00   | 26%                     | 675                    |      |
| 2001 | 090177    | Saginaw River         | Chloride   | 216,645,836.00 | 25%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River         | Chloride   | 251,547,959.00 | 23%                     | 4520                   |      |
| 2003 | 090177    | Saginaw River         | Chloride   | 209,195,005.00 | 22%                     | 2610                   |      |
| 2004 | 090177    | Saginaw River         | Chloride   | 261,115,748.00 | 18%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River         | Chloride   | 224,000,000.00 | 26%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River         | Chloride   | 257,000,000.00 | 29%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River         | Chloride   | 236,000,000.00 | 10%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River         | Chloride   | 253,000,000.00 | 7%                      | 4340                   |      |
| 2009 | 090177    | Saginaw River         | Chloride   | 243,000,000.00 | 21%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River         | Chloride   | 218,000,000.00 | 21%                     | 3737                   |      |

| YEAR | STORET ID | Waterbody Name | Parameter | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|-----------|----------------|-------------------------|------------------------|------|
| 2011 | 090177    | Saginaw River  | Chloride  | 297,000,000.00 | 18%                     | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Chloride  | 193,000,000.00 | 12%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Chloride  | 242,000,000.00 | 24%                     | 6899                   |      |
| 2001 | 090177    | Saginaw River  | Chromium  | 7,204.00       | 22%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | Chromium  | 6,240.00       | 95%                     | 4520                   |      |
| 2003 | 090177    | Saginaw River  | Chromium  | 1,990.00       | 21%                     | 2610                   |      |
| 2004 | 090177    | Saginaw River  | Chromium  | 10,299.00      | 39%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | Chromium  | 1,560.00       | 29%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | Chromium  | 12,100.00      | 42%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River  | Chromium  | 6,550.00       | 38%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | Chromium  | 11,300.00      | 60%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | Chromium  | 9,740.00       | 34%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | Chromium  | 3,940.00       | 34%                     | 3737                   |      |
| 2011 | 090177    | Saginaw River  | Chromium  | 11,227.00      | 11%                     | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Chromium  | 3,452.90       | 40%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Chromium  | 10,328.00      | 61%                     | 6899                   |      |
| 2001 | 090177    | Saginaw River  | Copper    | 11,538.00      | 18%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | Copper    | 10,529.00      | 46%                     | 4520                   |      |
| 2003 | 090177    | Saginaw River  | Copper    | 5,028.00       | 10%                     | 2610                   |      |
| 2004 | 090177    | Saginaw River  | Copper    | 17,538.00      | 19%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | Copper    | 6,740.00       | 15%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | Copper    | 19,400.00      | 31%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River  | Copper    | 9,050.00       | 19%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | Copper    | 13,300.00      | 23%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | Copper    | 15,800.00      | 20%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | Copper    | 7,720.00       | 24%                     | 3737                   |      |
| 2011 | 090177    | Saginaw River  | Copper    | 17,558.00      | 4%                      | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Copper    | 5,949.50       | 20%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Copper    | 16,563.00      | 26%                     | 6899                   |      |
| 2001 | 090177    | Saginaw River  | Lead      | 7,816.00       | 36%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | Lead      | 7,990.00       | 126%                    | 4520                   |      |
| 2003 | 090177    | Saginaw River  | Lead      | 2,532.00       | 8%                      | 2610                   |      |
| 2004 | 090177    | Saginaw River  | Lead      | 13,489.00      | 45%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | Lead      | 2,830.00       | 20%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | Lead      | 15,800.00      | 92%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River  | Lead      | 4,360.00       | 44%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | Lead      | 8,680.00       | 46%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | Lead      | 9,220.00       | 52%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | Lead      | 3,820.00       | 54%                     | 3737                   |      |



| YEAR | STORET ID | Waterbody Name | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|------------|----------------|-------------------------|------------------------|------|
| 2011 | 090177    | Saginaw River  | Lead       | 10,393.00      | 8%                      | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Lead       | 2,617.05       | 36%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Lead       | 8,959.00       | 154%                    | 6899                   |      |
| 2001 | 090177    | Saginaw River  | Mercury    | 18.00          | 29%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | Mercury    | 19.00          | 111%                    | 4520                   |      |
| 2003 | 090177    | Saginaw River  | Mercury    | 7.00           | 6%                      | 2610                   |      |
| 2004 | 090177    | Saginaw River  | Mercury    | 64.00          | 27%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | Mercury    | 8.09           | 19%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | Mercury    | 69.40          | 67%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River  | Mercury    | 15.60          | 55%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | Mercury    | 25.00          | 40%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | Mercury    | 34.40          | 43%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | Mercury    | 12.50          | 63%                     | 3737                   |      |
| 2011 | 090177    | Saginaw River  | Mercury    | 32.40          | 15%                     | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Mercury    | 9.13           | 63%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Mercury    | 41.00          | 74%                     | 6899                   |      |
| 2001 | 090177    | Saginaw River  | Phosphorus | 642,282.00     | 29%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | Phosphorus | 513,473.00     | 72%                     | 4520                   |      |
| 2003 | 090177    | Saginaw River  | Phosphorus | 227,166.00     | 10%                     | 2610                   |      |
| 2004 | 090177    | Saginaw River  | Phosphorus | 723,500.00     | 18%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | Phosphorus | 288,000.00     | 10%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | Phosphorus | 922,000.00     | 4%                      | 6160                   |      |
| 2007 | 090177    | Saginaw River  | Phosphorus | 400,000.00     | 32%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | Phosphorus | 580,000.00     | 27%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | Phosphorus | 806,000.00     | 36%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | Phosphorus | 331,000.00     | 29%                     | 3737                   |      |
| 2011 | 090177    | Saginaw River  | Phosphorus | 781,789.00     | 10%                     | 6645                   |      |
| 2012 | 090177    | Saginaw River  | Phosphorus | 272,882.00     | 14%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River  | Phosphorus | 756,388.00     | 35%                     | 6899                   |      |
| 2001 | 090177    | Saginaw River  | TSS        | 202,957,233.00 | 36%                     | 4440                   |      |
| 2002 | 090177    | Saginaw River  | TSS        | 180,571,635.00 | 133%                    | 4520                   |      |
| 2003 | 090177    | Saginaw River  | TSS        | 47,411,048.00  | 20%                     | 2610                   |      |
| 2004 | 090177    | Saginaw River  | TSS        | 349,881,847.00 | 40%                     | 5730                   |      |
| 2005 | 090177    | Saginaw River  | TSS        | 56,900,000.00  | 33%                     | 3474                   |      |
| 2006 | 090177    | Saginaw River  | TSS        | 431,000,000.00 | 89%                     | 6160                   |      |
| 2007 | 090177    | Saginaw River  | TSS        | 92,000,000.00  | 46%                     | 4440                   |      |
| 2008 | 090177    | Saginaw River  | TSS        | 184,000,000.00 | 51%                     | 4340                   |      |
| 2009 | 090177    | Saginaw River  | TSS        | 216,000,000.00 | 71%                     | 6532                   |      |
| 2010 | 090177    | Saginaw River  | TSS        | 88,100,000.00  | 60%                     | 3737                   |      |

| YEAR | STORET ID | Waterbody Name         | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------|------------|----------------|-------------------------|------------------------|------|
| 2011 | 090177    | Saginaw River          | TSS        | 216,000,000.00 | 26%                     | 6645                   |      |
| 2012 | 090177    | Saginaw River          | TSS        | 40,863,773.00  | 24%                     | 3360                   |      |
| 2013 | 090177    | Saginaw River          | TSS        | 288,000,000.00 | 197%                    | 6899                   |      |
| 2001 | 110628    | lower St. Joseph River | Chloride   | 117,084,435.00 | 7%                      | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Chloride   | 88,800,000.00  | 8%                      | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Chloride   | 126,000,000.00 | 4%                      | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | Chromium   | 4,884.00       | 35%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Chromium   | 474.00         | 25%                     | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Chromium   | 4,685.00       | 8%                      | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | Copper     | 10,442.00      | 25%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Copper     | 3,730.00       | 4%                      | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Copper     | 9,158.00       | 16%                     | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | Lead       | 8,886.00       | 28%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Lead       | 1,250.00       | 13%                     | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Lead       | 5,282.00       | 23%                     | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | Mercury    | 29.00          | 27%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Mercury    | 5.20           | 14%                     | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Mercury    | 25.00          | 27%                     | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | Phosphorus | 592,962.00     | 33%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | Phosphorus | 123,000.00     | 6%                      | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | Phosphorus | 418,897.00     | 26%                     | 4890                   |      |
| 2001 | 110628    | lower St. Joseph River | TSS        | 152,718,881.00 | 32%                     | 5000                   |      |
| 2005 | 110628    | lower St. Joseph River | TSS        | 25,800,000.00  | 21%                     | 2954                   |      |
| 2011 | 110628    | lower St. Joseph River | TSS        | 115,000,000.00 | 33%                     | 4890                   |      |
| 2005 | 160073    | Cheboygan River        | Chloride   | 8,630,000.00   | 7%                      | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Chloride   | 8,960,000.00   | 3%                      | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | Chromium   | 39.10          | 75%                     | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Chromium   | 235.00         | 57%                     | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | Copper     | 665.00         | 8%                      | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Copper     | 536.00         | 6%                      | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | Lead       | 52.00          | 28%                     | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Lead       | 37.60          | 20%                     | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | Mercury    | 0.53           | 29%                     | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Mercury    | 0.47           | 22%                     | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | Phosphorus | 12,400.00      | 37%                     | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | Phosphorus | 10,100.00      | 25%                     | 1157                   |      |
| 2005 | 160073    | Cheboygan River        | TSS        | 2,950,000.00   | 38%                     | 1218                   |      |
| 2010 | 160073    | Cheboygan River        | TSS        | 1,730,000.00   | 28%                     | 1157                   |      |
| 2004 | 170141    | Tahquamenon River      | Chloride   | 2,169,946.00   | 3%                      | 1130                   |      |

| YEAR | STORET ID | Waterbody Name    | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-------------------|------------|---------------|-------------------------|------------------------|------|
| 2009 | 170141    | Tahquamenon River | Chloride   | 2,100,000.00  | 3%                      | 986                    |      |
| 2004 | 170141    | Tahquamenon River | Chromium   | 438.00        | 25%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | Chromium   | 446.00        | 10%                     | 986                    |      |
| 2004 | 170141    | Tahquamenon River | Copper     | 467.00        | 15%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | Copper     | 368.00        | 10%                     | 986                    |      |
| 2004 | 170141    | Tahquamenon River | Lead       | 292.00        | 26%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | Lead       | 228.00        | 8%                      | 986                    |      |
| 2004 | 170141    | Tahquamenon River | Mercury    | 6.00          | 15%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | Mercury    | 4.75          | 18%                     | 986                    |      |
| 2004 | 170141    | Tahquamenon River | Phosphorus | 27,338.00     | 21%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | Phosphorus | 21,900.00     | 15%                     | 986                    |      |
| 2004 | 170141    | Tahquamenon River | TSS        | 4,692,440.00  | 48%                     | 1130                   |      |
| 2009 | 170141    | Tahquamenon River | TSS        | 5,460,000.00  | 29%                     | 986                    |      |
| 2001 | 210032    | Sturgeon River    | Chloride   | 464,280.00    | 8%                      | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Chloride   | 351,000.00    | 1000%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Chloride   | 440,281.00    | 8%                      | 185                    |      |
| 2001 | 210032    | Sturgeon River    | Chromium   | 96.00         | 23%                     | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Chromium   | 77.80         | 1700%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Chromium   | 131.00        | 19%                     | 185                    |      |
| 2001 | 210032    | Sturgeon River    | Copper     | 121.00        | 11%                     | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Copper     | 120.00        | 5800%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Copper     | 97.00         | 12%                     | 185                    |      |
| 2001 | 210032    | Sturgeon River    | Lead       | 63.00         | 34%                     | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Lead       | 30.00         | 1900%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Lead       | 53.00         | 19%                     | 185                    |      |
| 2001 | 210032    | Sturgeon River    | Mercury    | 1.00          | 20%                     | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Mercury    | 0.68          | 2400%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Mercury    | 1.11          | 11%                     | 185                    |      |
| 2001 | 210032    | Sturgeon River    | Phosphorus | 6,403.00      | 11%                     | 247                    |      |
| 2006 | 210032    | Sturgeon River    | Phosphorus | 3,590.00      | 1300%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | Phosphorus | 5,419.00      | 16%                     | 185                    |      |
| 2001 | 210032    | Sturgeon River    | TSS        | 4,814,715.00  | 104%                    | 247                    |      |
| 2006 | 210032    | Sturgeon River    | TSS        | 825,000.00    | 4400%                   | 165                    |      |
| 2011 | 210032    | Sturgeon River    | TSS        | 2,677,275.00  | 69%                     | 185                    |      |
| 2005 | 210102    | Escanaba River    | Chloride   | 9,540,000.00  | 17%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | Chloride   | 10,500,000.00 | 23%                     | 625                    |      |
| 2005 | 210102    | Escanaba River    | Chromium   | 227.00        | 29%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | Chromium   | 335.00        | 21%                     | 625                    |      |
| 2005 | 210102    | Escanaba River    | Copper     | 528.00        | 23%                     | 704                    |      |

| YEAR | STORET ID | Waterbody Name    | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-------------------|------------|----------------|-------------------------|------------------------|------|
| 2010 | 210102    | Escanaba River    | Copper     | 337.00         | 8%                      | 625                    |      |
| 2005 | 210102    | Escanaba River    | Lead       | 152.00         | 58%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | Lead       | 123.00         | 20%                     | 625                    |      |
| 2005 | 210102    | Escanaba River    | Mercury    | 2.69           | 46%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | Mercury    | 2.00           | 16%                     | 625                    |      |
| 2005 | 210102    | Escanaba River    | Phosphorus | 20,300.00      | 24%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | Phosphorus | 19,700.00      | 17%                     | 625                    |      |
| 2005 | 210102    | Escanaba River    | TSS        | 3,270,000.00   | 82%                     | 704                    |      |
| 2010 | 210102    | Escanaba River    | TSS        | 3,740,000.00   | 37%                     | 625                    |      |
| 2003 | 280014    | Boardman River    | Chloride   | 1,463,496.00   | 6%                      | 198                    |      |
| 2008 | 280014    | Boardman River    | Chloride   | 1,590,000.00   | 4%                      | 215                    |      |
| 2013 | 280014    | Boardman River    | Chloride   | 2,149,648.00   | 3%                      | 283                    |      |
| 2003 | 280014    | Boardman River    | Chromium   | 9.10           | 53%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | Chromium   | 86.30          | 63%                     | 215                    |      |
| 2013 | 280014    | Boardman River    | Chromium   | 132.00         | 14%                     | 283                    |      |
| 2003 | 280014    | Boardman River    | Copper     | 51.00          | 19%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | Copper     | 102.00         | 46%                     | 215                    |      |
| 2013 | 280014    | Boardman River    | Copper     | 125.00         | 16%                     | 283                    |      |
| 2003 | 280014    | Boardman River    | Lead       | 36.50          | 27%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | Lead       | 48.40          | 118%                    | 215                    |      |
| 2013 | 280014    | Boardman River    | Lead       | 71.00          | 45%                     | 283                    |      |
| 2003 | 280014    | Boardman River    | Mercury    | 0.37           | 27%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | Mercury    | 0.39           | 90%                     | 215                    |      |
| 2013 | 280014    | Boardman River    | Mercury    | 0.73           | 38%                     | 283                    |      |
| 2003 | 280014    | Boardman River    | Phosphorus | 2,446.00       | 24%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | Phosphorus | 3,990.00       | 91%                     | 215                    |      |
| 2013 | 280014    | Boardman River    | Phosphorus | 4,417.00       | 38%                     | 283                    |      |
| 2003 | 280014    | Boardman River    | TSS        | 750,805.00     | 37%                     | 198                    |      |
| 2008 | 280014    | Boardman River    | TSS        | 2,450,000.00   | 118%                    | 215                    |      |
| 2013 | 280014    | Boardman River    | TSS        | 2,548,710.00   | 27%                     | 283                    |      |
| 2001 | 340025    | upper Grand River | Chloride   | 91,544,920.00  | 15%                     | 2700                   |      |
| 2006 | 340025    | upper Grand River | Chloride   | 96,600,000.00  | 1600%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Chloride   | 122,000,000.00 | 20%                     | 3056                   |      |
| 2001 | 340025    | upper Grand River | Chromium   | 5,012.00       | 109%                    | 2700                   |      |
| 2006 | 340025    | upper Grand River | Chromium   | 2,780.00       | 3400%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Chromium   | 4,259.00       | 8%                      | 3056                   |      |
| 2001 | 340025    | upper Grand River | Copper     | 7,808.00       | 43%                     | 2700                   |      |
| 2006 | 340025    | upper Grand River | Copper     | 7,060.00       | 1400%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Copper     | 9,643.00       | 5%                      | 3056                   |      |

| YEAR | STORET ID | Waterbody Name    | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-------------------|------------|----------------|-------------------------|------------------------|------|
| 2001 | 340025    | upper Grand River | Lead       | 6,191.00       | 104%                    | 2700                   |      |
| 2006 | 340025    | upper Grand River | Lead       | 3,000.00       | 4400%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Lead       | 4,379.00       | 11%                     | 3056                   |      |
| 2001 | 340025    | upper Grand River | Mercury    | 14.00          | 120%                    | 2700                   |      |
| 2006 | 340025    | upper Grand River | Mercury    | 12.00          | 4100%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Mercury    | 18.40          | 5%                      | 3056                   |      |
| 2001 | 340025    | upper Grand River | Phosphorus | 358,623.00     | 23%                     | 2700                   |      |
| 2006 | 340025    | upper Grand River | Phosphorus | 311,000.00     | 2200%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | Phosphorus | 426,143.00     | 10%                     | 3056                   |      |
| 2001 | 340025    | upper Grand River | TSS        | 187,123,088.00 | 170%                    | 2700                   |      |
| 2006 | 340025    | upper Grand River | TSS        | 49,600,000.00  | 4500%                   | 2400                   |      |
| 2011 | 340025    | upper Grand River | TSS        | 68,690,320.00  | 14%                     | 3056                   |      |
| 2001 | 350061    | Au Sable River    | Chloride   | 6,802,772.00   | 3%                      | 1280                   |      |
| 2002 | 350061    | Au Sable River    | Chloride   | 6,807,888.00   | 9%                      | 1260                   |      |
| 2003 | 350061    | Au Sable River    | Chloride   | 6,229,729.00   | 1%                      | 1160                   |      |
| 2004 | 350061    | Au Sable River    | Chloride   | 10,464,915.00  | 47%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River    | Chloride   | 6,950,000.00   | 4%                      | 1266                   |      |
| 2006 | 350061    | Au Sable River    | Chloride   | 8,540,000.00   | 7%                      | 1480                   |      |
| 2007 | 350061    | Au Sable River    | Chloride   | 7,350,000.00   | 5%                      | 1330                   |      |
| 2008 | 350061    | Au Sable River    | Chloride   | 8,130,000.00   | 6%                      | 1450                   |      |
| 2009 | 350061    | Au Sable River    | Chloride   | 7,900,000.00   | 1%                      | 1442                   |      |
| 2010 | 350061    | Au Sable River    | Chloride   | 7,140,000.00   | 5%                      | 1232                   |      |
| 2011 | 350061    | Au Sable River    | Chloride   | 7,558,766.00   | 3%                      | 1370                   |      |
| 2012 | 350061    | Au Sable River    | Chloride   | 6,563,684.00   | 9%                      | 1226                   |      |
| 2013 | 350061    | Au Sable River    | Chloride   | 7,774,031.00   | 7%                      | 1427                   |      |
| 2001 | 350061    | Au Sable River    | Chromium   | 39.00          | 31%                     | 1280                   |      |
| 2002 | 350061    | Au Sable River    | Chromium   | 24.50          | 22%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River    | Chromium   | 4.40           | 193%                    | 1160                   |      |
| 2004 | 350061    | Au Sable River    | Chromium   | 73.00          | 23%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River    | Chromium   | 7.54           | 81%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River    | Chromium   | 315.00         | 41%                     | 1480                   |      |
| 2007 | 350061    | Au Sable River    | Chromium   | 527.00         | 22%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River    | Chromium   | 412.00         | 47%                     | 1450                   |      |
| 2009 | 350061    | Au Sable River    | Chromium   | 314.00         | 35%                     | 1442                   |      |
| 2010 | 350061    | Au Sable River    | Chromium   | 165.00         | 70%                     | 1232                   |      |
| 2011 | 350061    | Au Sable River    | Chromium   | 288.00         | 16%                     | 1370                   |      |
| 2012 | 350061    | Au Sable River    | Chromium   | 221.00         | 26%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River    | Chromium   | 517.00         | 6%                      | 1427                   |      |
| 2001 | 350061    | Au Sable River    | Copper     | 219.00         | 16%                     | 1280                   |      |

| YEAR | STORET ID | Waterbody Name | Parameter  | Mean kg/year | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|------------|--------------|-------------------------|------------------------|------|
| 2002 | 350061    | Au Sable River | Copper     | 232.00       | 15%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River | Copper     | 219.00       | 18%                     | 1160                   |      |
| 2004 | 350061    | Au Sable River | Copper     | 386.00       | 17%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River | Copper     | 383.00       | 12%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River | Copper     | 416.00       | 7%                      | 1480                   |      |
| 2007 | 350061    | Au Sable River | Copper     | 376.00       | 11%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River | Copper     | 475.00       | 3%                      | 1450                   |      |
| 2009 | 350061    | Au Sable River | Copper     | 324.00       | 3%                      | 1442                   |      |
| 2010 | 350061    | Au Sable River | Copper     | 282.00       | 2%                      | 1232                   |      |
| 2011 | 350061    | Au Sable River | Copper     | 414.00       | 24%                     | 1370                   |      |
| 2012 | 350061    | Au Sable River | Copper     | 261.00       | 18%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River | Copper     | 307.00       | 9%                      | 1427                   |      |
| 2001 | 350061    | Au Sable River | Lead       | 60.00        | 12%                     | 1280                   |      |
| 2002 | 350061    | Au Sable River | Lead       | 36.50        | 30%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River | Lead       | 47.00        | 19%                     | 1160                   |      |
| 2004 | 350061    | Au Sable River | Lead       | 73.00        | 18%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River | Lead       | 43.10        | 20%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River | Lead       | 65.40        | 32%                     | 1480                   |      |
| 2007 | 350061    | Au Sable River | Lead       | 58.80        | 56%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River | Lead       | 43.50        | 19%                     | 1450                   |      |
| 2009 | 350061    | Au Sable River | Lead       | 40.60        | 26%                     | 1442                   |      |
| 2010 | 350061    | Au Sable River | Lead       | 28.00        | 8%                      | 1232                   |      |
| 2011 | 350061    | Au Sable River | Lead       | 46.00        | 16%                     | 1370                   |      |
| 2012 | 350061    | Au Sable River | Lead       | 48.18        | 20%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River | Lead       | 64.00        | 20%                     | 1427                   |      |
| 2001 | 350061    | Au Sable River | Mercury    | 0.36         | 140%                    | 1280                   |      |
| 2002 | 350061    | Au Sable River | Mercury    | 0.37         | 55%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River | Mercury    | 0.37         | 27%                     | 1160                   |      |
| 2004 | 350061    | Au Sable River | Mercury    | 1.00         | 10%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River | Mercury    | 0.39         | 30%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River | Mercury    | 0.85         | 9%                      | 1480                   |      |
| 2007 | 350061    | Au Sable River | Mercury    | 0.55         | 18%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River | Mercury    | 0.58         | 25%                     | 1450                   |      |
| 2009 | 350061    | Au Sable River | Mercury    | 0.58         | 20%                     | 1442                   |      |
| 2010 | 350061    | Au Sable River | Mercury    | 0.34         | 6%                      | 1232                   |      |
| 2011 | 350061    | Au Sable River | Mercury    | 0.54         | 28%                     | 1370                   |      |
| 2012 | 350061    | Au Sable River | Mercury    | 0.47         | 19%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River | Mercury    | 0.64         | 18%                     | 1427                   |      |
| 2001 | 350061    | Au Sable River | Phosphorus | 10,379.00    | 15%                     | 1280                   |      |

| YEAR | STORET ID | Waterbody Name        | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-----------------------|------------|---------------|-------------------------|------------------------|------|
| 2002 | 350061    | Au Sable River        | Phosphorus | 8,068.00      | 17%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River        | Phosphorus | 11,071.00     | 18%                     | 1160                   |      |
| 2004 | 350061    | Au Sable River        | Phosphorus | 12,228.00     | 20%                     | 1420                   |      |
| 2005 | 350061    | Au Sable River        | Phosphorus | 9,990.00      | 17%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River        | Phosphorus | 13,700.00     | 15%                     | 1480                   |      |
| 2007 | 350061    | Au Sable River        | Phosphorus | 12,500.00     | 13%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River        | Phosphorus | 13,100.00     | 11%                     | 1450                   |      |
| 2009 | 350061    | Au Sable River        | Phosphorus | 12,200.00     | 8%                      | 1442                   |      |
| 2010 | 350061    | Au Sable River        | Phosphorus | 13,300.00     | 39%                     | 1232                   |      |
| 2011 | 350061    | Au Sable River        | Phosphorus | 12,071.00     | 8%                      | 1370                   |      |
| 2012 | 350061    | Au Sable River        | Phosphorus | 8,468.00      | 30%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River        | Phosphorus | 10,439.00     | 14%                     | 1427                   |      |
| 2001 | 350061    | Au Sable River        | TSS        | 2,274,315.00  | 0%                      | 1280                   |      |
| 2002 | 350061    | Au Sable River        | TSS        | 29,824.00     | 47%                     | 1260                   |      |
| 2003 | 350061    | Au Sable River        | TSS        | 2,081,230.00  | 1%                      | 1160                   |      |
| 2004 | 350061    | Au Sable River        | TSS        | 2,543,320.00  | 0%                      | 1420                   |      |
| 2005 | 350061    | Au Sable River        | TSS        | 494,000.00    | 87%                     | 1266                   |      |
| 2006 | 350061    | Au Sable River        | TSS        | 2,850,000.00  | 46%                     | 1480                   |      |
| 2007 | 350061    | Au Sable River        | TSS        | 1,540,000.00  | 46%                     | 1330                   |      |
| 2008 | 350061    | Au Sable River        | TSS        | 1,320,000.00  | 43%                     | 1450                   |      |
| 2009 | 350061    | Au Sable River        | TSS        | 5,280,000.00  | 6%                      | 1442                   |      |
| 2010 | 350061    | Au Sable River        | TSS        | 1,490,000.00  | 34%                     | 1232                   |      |
| 2011 | 350061    | Au Sable River        | TSS        | 5,237,635.00  | 9%                      | 1370                   |      |
| 2012 | 350061    | Au Sable River        | TSS        | 2,437,105.00  | 20%                     | 1226                   |      |
| 2013 | 350061    | Au Sable River        | TSS        | 3,589,450.00  | 21%                     | 1427                   |      |
| 2009 | 390598    | upper Kalamazoo River | Chloride   | 29,500,000.00 | 9%                      | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Chloride   | 27,155,134.00 | 13%                     | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | Chromium   | 773.00        | 11%                     | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Chromium   | 1,394.00      | 22%                     | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | Copper     | 1,080.00      | 7%                      | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Copper     | 1,428.00      | 4%                      | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | Lead       | 722.00        | 33%                     | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Lead       | 1,152.00      | 28%                     | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | Mercury    | 3.60          | 27%                     | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Mercury    | 5.38          | 15%                     | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | Phosphorus | 47,400.00     | 10%                     | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | Phosphorus | 62,780.00     | 23%                     | 1011                   |      |
| 2009 | 390598    | upper Kalamazoo River | TSS        | 8,600,000.00  | 19%                     | 1105                   |      |
| 2011 | 390598    | upper Kalamazoo River | TSS        | 18,151,993.00 | 20%                     | 1011                   |      |

| YEAR | STORET ID | Waterbody Name | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|------------|----------------|-------------------------|------------------------|------|
| 2004 | 490006    | Pine River     | Chloride   | 922,350.00     | 11%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Chloride   | 934,000.00     | 46%                     | 275                    |      |
| 2004 | 490006    | Pine River     | Chromium   | 954.00         | 21%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Chromium   | 660.00         | 33%                     | 275                    |      |
| 2004 | 490006    | Pine River     | Copper     | 767.00         | 16%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Copper     | 573.00         | 26%                     | 275                    |      |
| 2004 | 490006    | Pine River     | Lead       | 440.00         | 20%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Lead       | 352.00         | 33%                     | 275                    |      |
| 2004 | 490006    | Pine River     | Mercury    | 2.00           | 10%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Mercury    | 2.31           | 26%                     | 275                    |      |
| 2004 | 490006    | Pine River     | Phosphorus | 37,268.00      | 18%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | Phosphorus | 44,700.00      | 32%                     | 275                    |      |
| 2004 | 490006    | Pine River     | TSS        | 29,824,781.00  | 13%                     | 1140                   |      |
| 2009 | 490006    | Pine River     | TSS        | 26,800,000.00  | 48%                     | 275                    |      |
| 2001 | 500233    | Clinton River  | Chloride   | 71,843,680.00  | 12%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Chloride   | 57,284,817.00  | 8%                      | 485                    |      |
| 2003 | 500233    | Clinton River  | Chloride   | 76,690,665.00  | 16%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Chloride   | 80,268,280.00  | 27%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Chloride   | 72,900,000.00  | 36%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Chloride   | 74,200,000.00  | 14%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Chloride   | 81,100,000.00  | 16%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Chloride   | 93,900,000.00  | 30%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Chloride   | 99,100,000.00  | 21%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Chloride   | 76,700,000.00  | 13%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | Chloride   | 125,000,000.00 | 12%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Chloride   | 51,952,692.00  | 19%                     | 399                    |      |
| 2013 | 500233    | Clinton River  | Chloride   | 74,801,800.00  | 14%                     | 724                    |      |
| 2001 | 500233    | Clinton River  | Chromium   | 2,810.00       | 46%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Chromium   | 1,186.00       | 33%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | Chromium   | 2,263.00       | 65%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Chromium   | 3,047.00       | 42%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Chromium   | 691.00         | 33%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Chromium   | 1,850.00       | 19%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Chromium   | 1,210.00       | 35%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Chromium   | 1,260.00       | 26%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Chromium   | 2,220.00       | 20%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Chromium   | 827.00         | 26%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | Chromium   | 3,816.00       | 30%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Chromium   | 701.00         | 46%                     | 399                    |      |



| YEAR | STORET ID | Waterbody Name | Parameter | Mean kg/year | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|-----------|--------------|-------------------------|------------------------|------|
| 2013 | 500233    | Clinton River  | Chromium  | 1,589.00     | 17%                     | 724                    |      |
| 2001 | 500233    | Clinton River  | Copper    | 4,234.00     | 30%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Copper    | 2,116.00     | 23%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | Copper    | 3,796.00     | 47%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Copper    | 4,185.00     | 20%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Copper    | 1,670.00     | 13%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Copper    | 3,190.00     | 12%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Copper    | 1,970.00     | 19%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Copper    | 2,330.00     | 19%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Copper    | 3,990.00     | 10%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Copper    | 1,760.00     | 11%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | Copper    | 6,892.00     | 31%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Copper    | 1,379.00     | 36%                     | 399                    |      |
| 2013 | 500233    | Clinton River  | Copper    | 3,020.00     | 12%                     | 724                    |      |
| 2001 | 500233    | Clinton River  | Lead      | 4,017.00     | 52%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Lead      | 1,649.00     | 48%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | Lead      | 3,248.00     | 68%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Lead      | 3,788.00     | 35%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Lead      | 975.00       | 30%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Lead      | 2,170.00     | 24%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Lead      | 1,210.00     | 42%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Lead      | 1,150.00     | 25%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Lead      | 2,430.00     | 32%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Lead      | 843.00       | 34%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | Lead      | 6,125.00     | 43%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Lead      | 772.00       | 81%                     | 399                    |      |
| 2013 | 500233    | Clinton River  | Lead      | 1,747.00     | 20%                     | 724                    |      |
| 2001 | 500233    | Clinton River  | Mercury   | 6.00         | 40%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Mercury   | 3.29         | 40%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | Mercury   | 5.80         | 66%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Mercury   | 8.00         | 39%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Mercury   | 2.03         | 34%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Mercury   | 5.76         | 27%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Mercury   | 2.82         | 48%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Mercury   | 3.36         | 31%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Mercury   | 6.40         | 27%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Mercury   | 1.91         | 22%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | Mercury   | 11.20        | 34%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Mercury   | 2.11         | 71%                     | 399                    |      |

| YEAR | STORET ID | Waterbody Name | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|------------|---------------|-------------------------|------------------------|------|
| 2013 | 500233    | Clinton River  | Mercury    | 4.23          | 26%                     | 724                    |      |
| 2001 | 500233    | Clinton River  | Phosphorus | 164,250.00    | 18%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | Phosphorus | 82,968.00     | 24%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | Phosphorus | 117,530.00    | 42%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | Phosphorus | 151,722.00    | 22%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | Phosphorus | 53,500.00     | 10%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | Phosphorus | 119,000.00    | 11%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | Phosphorus | 73,500.00     | 29%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | Phosphorus | 82,000.00     | 17%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | Phosphorus | 158,000.00    | 26%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | Phosphorus | 65,300.00     | 7%                      | 562                    |      |
| 2011 | 500233    | Clinton River  | Phosphorus | 197,716.00    | 22%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | Phosphorus | 50,222.00     | 20%                     | 399                    |      |
| 2013 | 500233    | Clinton River  | Phosphorus | 94,543.00     | 8%                      | 724                    |      |
| 2001 | 500233    | Clinton River  | TSS        | 57,456,943.00 | 40%                     | 758                    |      |
| 2002 | 500233    | Clinton River  | TSS        | 24,421,518.00 | 50%                     | 485                    |      |
| 2003 | 500233    | Clinton River  | TSS        | 44,305,890.00 | 57%                     | 508                    |      |
| 2004 | 500233    | Clinton River  | TSS        | 59,477,611.00 | 39%                     | 709                    |      |
| 2005 | 500233    | Clinton River  | TSS        | 10,800,000.00 | 37%                     | 452                    |      |
| 2006 | 500233    | Clinton River  | TSS        | 32,700,000.00 | 11%                     | 763                    |      |
| 2007 | 500233    | Clinton River  | TSS        | 18,300,000.00 | 61%                     | 516                    |      |
| 2008 | 500233    | Clinton River  | TSS        | 17,200,000.00 | 35%                     | 714                    |      |
| 2009 | 500233    | Clinton River  | TSS        | 41,500,000.00 | 36%                     | 1115                   |      |
| 2010 | 500233    | Clinton River  | TSS        | 11,600,000.00 | 33%                     | 562                    |      |
| 2011 | 500233    | Clinton River  | TSS        | 65,637,520.00 | 45%                     | 1123                   |      |
| 2012 | 500233    | Clinton River  | TSS        | 3,400,816.00  | 41%                     | 399                    |      |
| 2013 | 500233    | Clinton River  | TSS        | 24,638,230.00 | 29%                     | 724                    |      |
| 2004 | 510088    | Manistee River | Chloride   | 21,289,158.00 | 10%                     | 2610                   |      |
| 2009 | 510088    | Manistee River | Chloride   | 25,400,000.00 | 8%                      | 2386                   |      |
| 2004 | 510088    | Manistee River | Chromium   | 494.00        | 10%                     | 2610                   |      |
| 2009 | 510088    | Manistee River | Chromium   | 1,080.00      | 13%                     | 2386                   |      |
| 2004 | 510088    | Manistee River | Copper     | 893.00        | 8%                      | 2610                   |      |
| 2009 | 510088    | Manistee River | Copper     | 1,000.00      | 3%                      | 2386                   |      |
| 2004 | 510088    | Manistee River | Lead       | 380.00        | 7%                      | 2610                   |      |
| 2009 | 510088    | Manistee River | Lead       | 357.00        | 8%                      | 2386                   |      |
| 2004 | 510088    | Manistee River | Mercury    | 2.00          | 20%                     | 2610                   |      |
| 2009 | 510088    | Manistee River | Mercury    | 2.57          | 11%                     | 2386                   |      |
| 2004 | 510088    | Manistee River | Phosphorus | 47,952.00     | 5%                      | 2610                   |      |
| 2009 | 510088    | Manistee River | Phosphorus | 47,200.00     | 14%                     | 2386                   |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|---------------|-------------------------|------------------------|------|
| 2004 | 510088    | Manistee River       | TSS        | 18,657,418.00 | 10%                     | 2610                   |      |
| 2009 | 510088    | Manistee River       | TSS        | 19,300,000.00 | 29%                     | 2386                   |      |
| 2005 | 530027    | Pere Marquette River | Chloride   | 10,800,000.00 | 53%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Chloride   | 6,530,000.00  | 11%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | Chromium   | 65.90         | 30%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Chromium   | 355.00        | 55%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | Copper     | 314.00        | 14%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Copper     | 286.00        | 23%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | Lead       | 119.00        | 19%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Lead       | 167.00        | 13%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | Mercury    | 0.88          | 23%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Mercury    | 1.18          | 24%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | Phosphorus | 18,000.00     | 22%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | Phosphorus | 22,000.00     | 20%                     | 628                    |      |
| 2005 | 530027    | Pere Marquette River | TSS        | 4,830,000.00  | 32%                     | 645                    |      |
| 2010 | 530027    | Pere Marquette River | TSS        | 6,250,000.00  | 11%                     | 628                    |      |
| 2002 | 550038    | Menominee River      | Chloride   | 23,373,908.00 | 8%                      | 5260                   |      |
| 2007 | 550038    | Menominee River      | Chloride   | 14,000,000.00 | 5%                      | 2090                   |      |
| 2011 | 550038    | Menominee River      | Chloride   | 18,862,027.00 | 10%                     | 3087                   |      |
| 2012 | 550038    | Menominee River      | Chloride   | 15,296,176.00 | 10%                     | 2050                   |      |
| 2002 | 550038    | Menominee River      | Chromium   | 1,946.00      | 32%                     | 5260                   |      |
| 2007 | 550038    | Menominee River      | Chromium   | 1,240.00      | 19%                     | 2090                   |      |
| 2011 | 550038    | Menominee River      | Chromium   | 1,840.00      | 22%                     | 3087                   |      |
| 2012 | 550038    | Menominee River      | Chromium   | 789.00        | 17%                     | 2050                   |      |
| 2002 | 550038    | Menominee River      | Copper     | 4,745.00      | 12%                     | 5260                   |      |
| 2007 | 550038    | Menominee River      | Copper     | 1,670.00      | 16%                     | 2090                   |      |
| 2011 | 550038    | Menominee River      | Copper     | 2,531.00      | 15%                     | 3087                   |      |
| 2012 | 550038    | Menominee River      | Copper     | 1,360.00      | 5%                      | 2050                   |      |
| 2002 | 550038    | Menominee River      | Lead       | 1,406.00      | 37%                     | 5260                   |      |
| 2007 | 550038    | Menominee River      | Lead       | 234.00        | 25%                     | 2090                   |      |
| 2011 | 550038    | Menominee River      | Lead       | 1,263.00      | 61%                     | 3087                   |      |
| 2012 | 550038    | Menominee River      | Lead       | 229.00        | 21%                     | 2050                   |      |
| 2002 | 550038    | Menominee River      | Mercury    | 28.00         | 22%                     | 5260                   |      |
| 2007 | 550038    | Menominee River      | Mercury    | 4.80          | 15%                     | 2090                   |      |
| 2011 | 550038    | Menominee River      | Mercury    | 12.30         | 17%                     | 3087                   |      |
| 2012 | 550038    | Menominee River      | Mercury    | 4.88          | 16%                     | 2050                   |      |
| 2002 | 550038    | Menominee River      | Phosphorus | 208,571.00    | 34%                     | 5260                   |      |
| 2007 | 550038    | Menominee River      | Phosphorus | 56,200.00     | 17%                     | 2090                   |      |
| 2011 | 550038    | Menominee River      | Phosphorus | 96,203.00     | 26%                     | 3087                   |      |

| YEAR | STORET ID | Waterbody Name  | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-----------------|------------|---------------|-------------------------|------------------------|------|
| 2012 | 550038    | Menominee River | Phosphorus | 45,780.00     | 13%                     | 2050                   |      |
| 2002 | 550038    | Menominee River | TSS        | 58,343,954.00 | 68%                     | 5260                   |      |
| 2007 | 550038    | Menominee River | TSS        | 8,580,000.00  | 52%                     | 2090                   |      |
| 2011 | 550038    | Menominee River | TSS        | 30,669,656.00 | 52%                     | 3087                   |      |
| 2012 | 550038    | Menominee River | TSS        | 11,372,305.00 | 40%                     | 2050                   |      |
| 2003 | 580046    | River Raisin    | Chloride   | 25,934,986.00 | 12%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Chloride   | 27,100,000.00 | 33%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Chloride   | 29,653,008.00 | 7%                      | 798                    |      |
| 2003 | 580046    | River Raisin    | Chromium   | 992.00        | 62%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Chromium   | 2,010.00      | 37%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Chromium   | 1,828.00      | 102%                    | 798                    |      |
| 2003 | 580046    | River Raisin    | Copper     | 2,037.00      | 31%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Copper     | 3,170.00      | 17%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Copper     | 2,983.00      | 53%                     | 798                    |      |
| 2003 | 580046    | River Raisin    | Lead       | 1,241.00      | 57%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Lead       | 1,310.00      | 39%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Lead       | 2,015.00      | 118%                    | 798                    |      |
| 2003 | 580046    | River Raisin    | Mercury    | 2.92          | 52%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Mercury    | 4.51          | 28%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Mercury    | 5.18          | 121%                    | 798                    |      |
| 2003 | 580046    | River Raisin    | Phosphorus | 106,580.00    | 46%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | Phosphorus | 127,000.00    | 18%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | Phosphorus | 147,736.00    | 79%                     | 798                    |      |
| 2003 | 580046    | River Raisin    | TSS        | 30,629,970.00 | 50%                     | 649                    |      |
| 2008 | 580046    | River Raisin    | TSS        | 24,600,000.00 | 18%                     | 973                    |      |
| 2013 | 580046    | River Raisin    | TSS        | 62,573,134.00 | 144%                    | 798                    |      |
| 2002 | 580364    | Huron River     | Chloride   | 41,188,516.00 | 5%                      | 474                    |      |
| 2007 | 580364    | Huron River     | Chloride   | 55,100,000.00 | 15%                     | 573                    |      |
| 2012 | 580364    | Huron River     | Chloride   | 38,158,785.00 | 8%                      | 436                    |      |
| 2002 | 580364    | Huron River     | Chromium   | 156.00        | 28%                     | 474                    |      |
| 2007 | 580364    | Huron River     | Chromium   | 594.00        | 20%                     | 573                    |      |
| 2012 | 580364    | Huron River     | Chromium   | 280.00        | 24%                     | 436                    |      |
| 2002 | 580364    | Huron River     | Copper     | 702.00        | 8%                      | 474                    |      |
| 2007 | 580364    | Huron River     | Copper     | 1,050.00      | 6%                      | 573                    |      |
| 2012 | 580364    | Huron River     | Copper     | 532.90        | 15%                     | 436                    |      |
| 2002 | 580364    | Huron River     | Lead       | 560.00        | 19%                     | 474                    |      |
| 2007 | 580364    | Huron River     | Lead       | 862.00        | 26%                     | 573                    |      |
| 2012 | 580364    | Huron River     | Lead       | 333.61        | 44%                     | 436                    |      |
| 2002 | 580364    | Huron River     | Mercury    | 0.73          | 20%                     | 474                    |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|---------------|-------------------------|------------------------|------|
| 2007 | 580364    | Huron River          | Mercury    | 1.06          | 21%                     | 573                    |      |
| 2012 | 580364    | Huron River          | Mercury    | 0.73          | 30%                     | 436                    |      |
| 2002 | 580364    | Huron River          | Phosphorus | 16,443.00     | 19%                     | 474                    |      |
| 2007 | 580364    | Huron River          | Phosphorus | 28,700.00     | 17%                     | 573                    |      |
| 2012 | 580364    | Huron River          | Phosphorus | 14,855.00     | 28%                     | 436                    |      |
| 2002 | 580364    | Huron River          | TSS        | 4,637,023.00  | 39%                     | 474                    |      |
| 2007 | 580364    | Huron River          | TSS        | 10,100,000.00 | 30%                     | 573                    |      |
| 2012 | 580364    | Huron River          | TSS        | 4,227,795.00  | 58%                     | 436                    |      |
| 2001 | 610273    | lower Muskegon River | Chloride   | 31,279,750.00 | 8%                      | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Chloride   | 31,295,830.00 | 4%                      | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Chloride   | 28,168,344.00 | 3%                      | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Chloride   | 35,186,842.00 | 5%                      | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Chloride   | 31,600,000.00 | 6%                      | 1822                   |      |
| 2006 | 610273    | lower Muskegon River | Chloride   | 38,300,000.00 | 14%                     | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Chloride   | 33,300,000.00 | 10%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Chloride   | 36,800,000.00 | 3%                      | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Chloride   | 36,700,000.00 | 5%                      | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Chloride   | 30,000,000.00 | 3%                      | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Chloride   | 39,036,963.00 | 5%                      | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Chloride   | 29,587,005.00 | 3%                      | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Chloride   | 36,790,899.00 | 12%                     | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | Chromium   | 401.00        | 53%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Chromium   | 210.00        | 54%                     | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Chromium   | 256.00        | 56%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Chromium   | 690.00        | 24%                     | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Chromium   | 87.60         | 46%                     | 1822                   |      |
| 2006 | 610273    | lower Muskegon River | Chromium   | 3,920.00      | 134%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Chromium   | 1,260.00      | 17%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Chromium   | 980.00        | 20%                     | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Chromium   | 903.00        | 13%                     | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Chromium   | 440.00        | 72%                     | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Chromium   | 1,220.00      | 14%                     | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Chromium   | 599.00        | 22%                     | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Chromium   | 1,416.00      | 30%                     | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | Copper     | 1,106.00      | 22%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Copper     | 1,051.00      | 9%                      | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Copper     | 892.00        | 14%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Copper     | 2,013.00      | 7%                      | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Copper     | 1,320.00      | 8%                      | 1822                   |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|--------------|-------------------------|------------------------|------|
| 2006 | 610273    | lower Muskegon River | Copper     | 4,480.00     | 102%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Copper     | 1,360.00     | 8%                      | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Copper     | 1,600.00     | 9%                      | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Copper     | 1,750.00     | 8%                      | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Copper     | 1,010.00     | 4%                      | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Copper     | 1,620.00     | 6%                      | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Copper     | 1,153.00     | 4%                      | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Copper     | 2,145.00     | 8%                      | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | Lead       | 496.00       | 51%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Lead       | 272.00       | 41%                     | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Lead       | 438.00       | 47%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Lead       | 675.00       | 22%                     | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Lead       | 168.00       | 18%                     | 1822                   |      |
| 2006 | 610273    | lower Muskegon River | Lead       | 4,190.00     | 150%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Lead       | 348.00       | 21%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Lead       | 375.00       | 36%                     | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Lead       | 484.00       | 22%                     | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Lead       | 232.00       | 15%                     | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Lead       | 420.00       | 17%                     | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Lead       | 296.00       | 7%                      | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Lead       | 702.00       | 21%                     | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | Mercury    | 2.00         | 55%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Mercury    | 1.83         | 20%                     | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Mercury    | 1.83         | 33%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Mercury    | 5.00         | 16%                     | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Mercury    | 1.51         | 24%                     | 1822                   |      |
| 2006 | 610273    | lower Muskegon River | Mercury    | 14.10        | 123%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Mercury    | 2.42         | 28%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Mercury    | 2.72         | 17%                     | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Mercury    | 3.79         | 12%                     | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Mercury    | 1.48         | 11%                     | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Mercury    | 2.90         | 11%                     | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Mercury    | 2.28         | 14%                     | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Mercury    | 5.09         | 21%                     | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | Phosphorus | 65,460.00    | 38%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | Phosphorus | 37,440.00    | 22%                     | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | Phosphorus | 48,545.00    | 48%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | Phosphorus | 87,958.00    | 15%                     | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | Phosphorus | 35,600.00    | 13%                     | 1822                   |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|----------------|-------------------------|------------------------|------|
| 2006 | 610273    | lower Muskegon River | Phosphorus | 208,000.00     | 111%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | Phosphorus | 52,500.00      | 14%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | Phosphorus | 63,400.00      | 22%                     | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | Phosphorus | 68,800.00      | 12%                     | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | Phosphorus | 43,800.00      | 14%                     | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | Phosphorus | 66,337.00      | 14%                     | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | Phosphorus | 47,245.00      | 20%                     | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | Phosphorus | 73,513.00      | 11%                     | 2651                   |      |
| 2001 | 610273    | lower Muskegon River | TSS        | 31,088,989.00  | 50%                     | 2250                   |      |
| 2002 | 610273    | lower Muskegon River | TSS        | 14,159,030.00  | 15%                     | 2000                   |      |
| 2003 | 610273    | lower Muskegon River | TSS        | 33,513,935.00  | 61%                     | 1920                   |      |
| 2004 | 610273    | lower Muskegon River | TSS        | 36,302,071.00  | 29%                     | 2650                   |      |
| 2005 | 610273    | lower Muskegon River | TSS        | 6,820,000.00   | 57%                     | 1822                   |      |
| 2006 | 610273    | lower Muskegon River | TSS        | 197,000,000.00 | 149%                    | 2610                   |      |
| 2007 | 610273    | lower Muskegon River | TSS        | 16,400,000.00  | 14%                     | 2120                   |      |
| 2008 | 610273    | lower Muskegon River | TSS        | 19,500,000.00  | 51%                     | 2200                   |      |
| 2009 | 610273    | lower Muskegon River | TSS        | 22,100,000.00  | 43%                     | 2513                   |      |
| 2010 | 610273    | lower Muskegon River | TSS        | 13,100,000.00  | 18%                     | 1824                   |      |
| 2011 | 610273    | lower Muskegon River | TSS        | 26,772,981.00  | 23%                     | 2426                   |      |
| 2012 | 610273    | lower Muskegon River | TSS        | 11,296,015.00  | 35%                     | 1994                   |      |
| 2013 | 610273    | lower Muskegon River | TSS        | 30,718,244.00  | 19%                     | 2651                   |      |
| 2008 | 660038    | Ontonagon River      | Chloride   | 2,850,000.00   | 1%                      | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Chloride   | 7,085,015.00   | 18%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | Chromium   | 18,700.00      | 94%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Chromium   | 9,021.00       | 59%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | Copper     | 18,300.00      | 85%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Copper     | 14,549.00      | 50%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | Lead       | 4,720.00       | 83%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Lead       | 3,979.00       | 59%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | Mercury    | 10.90          | 49%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Mercury    | 18.70          | 49%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | Phosphorus | 277,000.00     | 72%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | Phosphorus | 370,165.00     | 53%                     | 1957                   |      |
| 2008 | 660038    | Ontonagon River      | TSS        | 367,000,000.00 | 90%                     | 1280                   |      |
| 2013 | 660038    | Ontonagon River      | TSS        | 386,000,000.00 | 53%                     | 1957                   |      |
| 2001 | 670008    | upper Muskegon River | Chloride   | 17,883,540.00  | 14%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | Chloride   | 17,500,000.00  | 1400%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Chloride   | 17,082,236.00  | 11%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | Chromium   | 444.00         | 31%                     | 1515                   |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|----------------|-------------------------|------------------------|------|
| 2006 | 670008    | upper Muskegon River | Chromium   | 706.00         | 2800%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Chromium   | 718.00         | 10%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | Copper     | 837.00         | 14%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | Copper     | 1,340.00       | 600%                    | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Copper     | 1,132.00       | 16%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | Lead       | 459.00         | 40%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | Lead       | 460.00         | 3000%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Lead       | 347.00         | 17%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | Mercury    | 3.00           | 40%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | Mercury    | 4.64           | 1800%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Mercury    | 3.48           | 17%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | Phosphorus | 61,315.00      | 25%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | Phosphorus | 64,200.00      | 1100%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | Phosphorus | 47,148.00      | 23%                     | 1365                   |      |
| 2001 | 670008    | upper Muskegon River | TSS        | 17,428,544.00  | 40%                     | 1515                   |      |
| 2006 | 670008    | upper Muskegon River | TSS        | 17,000,000.00  | 2400%                   | 1510                   |      |
| 2011 | 670008    | upper Muskegon River | TSS        | 15,747,778.00  | 15%                     | 1365                   |      |
| 2001 | 700123    | lower Grand River    | Chloride   | 200,508,778.00 | 10%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River    | Chloride   | 160,586,800.00 | 4%                      | 3800                   |      |
| 2003 | 700123    | lower Grand River    | Chloride   | 130,079,334.00 | 14%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River    | Chloride   | 190,539,488.00 | 13%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River    | Chloride   | 169,000,000.00 | 4%                      | 3034                   |      |
| 2006 | 700123    | lower Grand River    | Chloride   | 204,000,000.00 | 9%                      | 4760                   |      |
| 2007 | 700123    | lower Grand River    | Chloride   | 178,000,000.00 | 4%                      | 4190                   |      |
| 2008 | 700123    | lower Grand River    | Chloride   | 208,000,000.00 | 10%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River    | Chloride   | 202,000,000.00 | 13%                     | 6296                   |      |
| 2010 | 700123    | lower Grand River    | Chloride   | 185,000,000.00 | 15%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River    | Chloride   | 225,000,000.00 | 11%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River    | Chloride   | 160,000,000.00 | 10%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River    | Chloride   | 202,000,000.00 | 23%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River    | Chromium   | 5,720.00       | 28%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River    | Chromium   | 3,571.00       | 33%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River    | Chromium   | 3,504.00       | 31%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River    | Chromium   | 5,709.00       | 37%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River    | Chromium   | 1,280.00       | 35%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River    | Chromium   | 8,340.00       | 58%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River    | Chromium   | 5,340.00       | 26%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River    | Chromium   | 8,900.00       | 22%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River    | Chromium   | 8,020.00       | 11%                     | 6296                   |      |



| YEAR | STORET ID | Waterbody Name    | Parameter | Mean kg/year | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-------------------|-----------|--------------|-------------------------|------------------------|------|
| 2010 | 700123    | lower Grand River | Chromium  | 5,480.00     | 32%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | Chromium  | 7,887.00     | 23%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River | Chromium  | 3,719.00     | 45%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | Chromium  | 9,144.00     | 34%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River | Copper    | 11,943.00    | 13%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River | Copper    | 7,930.00     | 13%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River | Copper    | 7,703.00     | 22%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River | Copper    | 12,982.00    | 13%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River | Copper    | 6,230.00     | 14%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River | Copper    | 14,600.00    | 27%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River | Copper    | 9,270.00     | 11%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River | Copper    | 11,800.00    | 8%                      | 5220                   |      |
| 2009 | 700123    | lower Grand River | Copper    | 14,000.00    | 10%                     | 6296                   |      |
| 2010 | 700123    | lower Grand River | Copper    | 8,860.00     | 16%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | Copper    | 14,715.00    | 5%                      | 6545                   |      |
| 2012 | 700123    | lower Grand River | Copper    | 6,610.00     | 22%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | Copper    | 14,856.00    | 13%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River | Lead      | 6,886.00     | 31%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River | Lead      | 4,797.00     | 28%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River | Lead      | 5,438.00     | 44%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River | Lead      | 7,676.00     | 36%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River | Lead      | 2,660.00     | 35%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River | Lead      | 10,100.00    | 61%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River | Lead      | 3,910.00     | 30%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River | Lead      | 6,210.00     | 36%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River | Lead      | 6,930.00     | 19%                     | 6296                   |      |
| 2010 | 700123    | lower Grand River | Lead      | 5,060.00     | 41%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | Lead      | 5,879.00     | 32%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River | Lead      | 3,215.00     | 49%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | Lead      | 8,421.00     | 42%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River | Mercury   | 16.00        | 26%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River | Mercury   | 13.00        | 35%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River | Mercury   | 15.00        | 45%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River | Mercury   | 25.00        | 27%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River | Mercury   | 8.02         | 34%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River | Mercury   | 33.40        | 63%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River | Mercury   | 14.60        | 30%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River | Mercury   | 21.20        | 23%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River | Mercury   | 29.70        | 16%                     | 6296                   |      |

| YEAR | STORET ID | Waterbody Name    | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|-------------------|------------|----------------|-------------------------|------------------------|------|
| 2010 | 700123    | lower Grand River | Mercury    | 17.60          | 40%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | Mercury    | 22.30          | 21%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River | Mercury    | 13.10          | 41%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | Mercury    | 30.80          | 35%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River | Phosphorus | 657,314.00     | 12%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River | Phosphorus | 321,653.00     | 11%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River | Phosphorus | 344,933.00     | 27%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River | Phosphorus | 658,396.00     | 14%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River | Phosphorus | 256,000.00     | 15%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River | Phosphorus | 683,000.00     | 37%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River | Phosphorus | 384,000.00     | 16%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River | Phosphorus | 604,000.00     | 17%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River | Phosphorus | 746,000.00     | 16%                     | 6296                   |      |
| 2010 | 700123    | lower Grand River | Phosphorus | 475,000.00     | 23%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | Phosphorus | 622,149.00     | 12%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River | Phosphorus | 359,368.00     | 27%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | Phosphorus | 696,776.00     | 16%                     | 6202                   |      |
| 2001 | 700123    | lower Grand River | TSS        | 148,498,235.00 | 43%                     | 5270                   |      |
| 2002 | 700123    | lower Grand River | TSS        | 91,973,783.00  | 19%                     | 3800                   |      |
| 2003 | 700123    | lower Grand River | TSS        | 101,442,367.00 | 35%                     | 2730                   |      |
| 2004 | 700123    | lower Grand River | TSS        | 156,689,167.00 | 55%                     | 5090                   |      |
| 2005 | 700123    | lower Grand River | TSS        | 59,900,000.00  | 37%                     | 3034                   |      |
| 2006 | 700123    | lower Grand River | TSS        | 236,000,000.00 | 77%                     | 4760                   |      |
| 2007 | 700123    | lower Grand River | TSS        | 61,100,000.00  | 39%                     | 4190                   |      |
| 2008 | 700123    | lower Grand River | TSS        | 105,000,000.00 | 29%                     | 5220                   |      |
| 2009 | 700123    | lower Grand River | TSS        | 136,000,000.00 | 22%                     | 6296                   |      |
| 2010 | 700123    | lower Grand River | TSS        | 131,000,000.00 | 39%                     | 4389                   |      |
| 2011 | 700123    | lower Grand River | TSS        | 131,000,000.00 | 40%                     | 6545                   |      |
| 2012 | 700123    | lower Grand River | TSS        | 87,520,065.00  | 62%                     | 3149                   |      |
| 2013 | 700123    | lower Grand River | TSS        | 133,000,000.00 | 44%                     | 6202                   |      |
| 2005 | 730023    | Shiawassee River  | Chloride   | 15,400,000.00  | 14%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River  | Chloride   | 22,100,000.00  | 19%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River  | Chromium   | 76.60          | 30%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River  | Chromium   | 453.00         | 37%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River  | Copper     | 392.00         | 22%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River  | Copper     | 643.00         | 18%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River  | Lead       | 115.00         | 29%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River  | Lead       | 315.00         | 34%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River  | Mercury    | 0.43           | 34%                     | 241                    |      |

| YEAR | STORET ID | Waterbody Name      | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|---------------------|------------|----------------|-------------------------|------------------------|------|
| 2010 | 730023    | Shiawassee River    | Mercury    | 1.24           | 45%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River    | Phosphorus | 13,000.00      | 32%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River    | Phosphorus | 30,200.00      | 37%                     | 396                    |      |
| 2005 | 730023    | Shiawassee River    | TSS        | 3,140,000.00   | 34%                     | 241                    |      |
| 2010 | 730023    | Shiawassee River    | TSS        | 8,540,000.00   | 30%                     | 396                    |      |
| 2001 | 730024    | Cass River          | Chloride   | 38,312,955.00  | 58%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Chloride   | 18,600,000.00  | 4200%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Chloride   | 24,972,603.00  | 8%                      | 947                    |      |
| 2001 | 730024    | Cass River          | Chromium   | 876.00         | 57%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Chromium   | 1,380.00       | 4700%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Chromium   | 1,628.00       | 15%                     | 947                    |      |
| 2001 | 730024    | Cass River          | Copper     | 1,496.00       | 29%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Copper     | 2,190.00       | 2500%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Copper     | 2,382.00       | 9%                      | 947                    |      |
| 2001 | 730024    | Cass River          | Lead       | 730.00         | 57%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Lead       | 1,292.00       | 6500%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Lead       | 1,039.00       | 28%                     | 947                    |      |
| 2001 | 730024    | Cass River          | Mercury    | 2.00           | 85%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Mercury    | 4.70           | 2700%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Mercury    | 5.50           | 18%                     | 947                    |      |
| 2001 | 730024    | Cass River          | Phosphorus | 92,089.00      | 48%                     | 682                    |      |
| 2006 | 730024    | Cass River          | Phosphorus | 122,000.00     | 3900%                   | 855                    |      |
| 2011 | 730024    | Cass River          | Phosphorus | 107,961.00     | 17%                     | 947                    |      |
| 2001 | 730024    | Cass River          | TSS        | 25,304,720.00  | 71%                     | 682                    |      |
| 2006 | 730024    | Cass River          | TSS        | 45,600,000.00  | 10500%                  | 855                    |      |
| 2011 | 730024    | Cass River          | TSS        | 32,187,669.00  | 29%                     | 947                    |      |
| 2002 | 730025    | Tittabawassee River | Chloride   | 89,694,576.00  | 22%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | Chloride   | 98,800,000.00  | 17%                     | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Chloride   | 110,000,000.00 | 19%                     | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | Chromium   | 1,298.00       | 36%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | Chromium   | 2,100.00       | 11%                     | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Chromium   | 929.00         | 33%                     | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | Copper     | 3,151.00       | 10%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | Copper     | 4,550.00       | 29%                     | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Copper     | 2,445.50       | 8%                      | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | Lead       | 1,432.00       | 38%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | Lead       | 1,910.00       | 32%                     | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Lead       | 554.00         | 23%                     | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | Mercury    | 6.21           | 17%                     | 1960                   |      |

| YEAR | STORET ID | Waterbody Name      | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|---------------------|------------|----------------|-------------------------|------------------------|------|
| 2007 | 730025    | Tittabawassee River | Mercury    | 6.04           | 9%                      | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Mercury    | 3.16           | 21%                     | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | Phosphorus | 125,010.00     | 25%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | Phosphorus | 119,000.00     | 9%                      | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | Phosphorus | 82,855.00      | 9%                      | 1582                   |      |
| 2002 | 730025    | Tittabawassee River | TSS        | 35,957,763.00  | 71%                     | 1960                   |      |
| 2007 | 730025    | Tittabawassee River | TSS        | 42,200,000.00  | 41%                     | 2000                   |      |
| 2012 | 730025    | Tittabawassee River | TSS        | 19,478,590.00  | 26%                     | 1582                   |      |
| 2003 | 730285    | Flint River         | Chloride   | 49,363,599.00  | 33%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Chloride   | 53,400,000.00  | 8%                      | 901                    |      |
| 2013 | 730285    | Flint River         | Chloride   | 57,197,198.00  | 12%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | Chromium   | 1,218.00       | 59%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Chromium   | 1,670.00       | 17%                     | 901                    |      |
| 2013 | 730285    | Flint River         | Chromium   | 4,118.00       | 60%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | Copper     | 2,432.00       | 73%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Copper     | 2,440.00       | 12%                     | 901                    |      |
| 2013 | 730285    | Flint River         | Copper     | 4,782.00       | 42%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | Lead       | 2,325.00       | 68%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Lead       | 2,150.00       | 28%                     | 901                    |      |
| 2013 | 730285    | Flint River         | Lead       | 5,548.00       | 65%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | Mercury    | 4.75           | 57%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Mercury    | 4.12           | 19%                     | 901                    |      |
| 2013 | 730285    | Flint River         | Mercury    | 12.40          | 53%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | Phosphorus | 108,067.00     | 87%                     | 568                    |      |
| 2008 | 730285    | Flint River         | Phosphorus | 114,000.00     | 16%                     | 901                    |      |
| 2013 | 730285    | Flint River         | Phosphorus | 242,485.00     | 47%                     | 1128                   |      |
| 2003 | 730285    | Flint River         | TSS        | 36,046,296.00  | 92%                     | 568                    |      |
| 2008 | 730285    | Flint River         | TSS        | 27,900,000.00  | 24%                     | 901                    |      |
| 2013 | 730285    | Flint River         | TSS        | 107,000,000.00 | 74%                     | 1128                   |      |
| 2007 | 740267    | Black River         | Chloride   | 7,310,000.00   | 69%                     | 324                    | ‡    |
| 2012 | 740267    | Black River         | Chloride   | 7,133,286.00   | 22%                     | 174                    |      |
| 2007 | 740267    | Black River         | Chromium   | 1,110.00       | 22%                     | 324                    |      |
| 2012 | 740267    | Black River         | Chromium   | 223.38         | 51%                     | 174                    |      |
| 2007 | 740267    | Black River         | Copper     | 1,300.00       | 16%                     | 324                    |      |
| 2012 | 740267    | Black River         | Copper     | 397.85         | 33%                     | 174                    |      |
| 2007 | 740267    | Black River         | Lead       | 927.00         | 26%                     | 324                    |      |
| 2012 | 740267    | Black River         | Lead       | 167.17         | 59%                     | 174                    |      |
| 2007 | 740267    | Black River         | Mercury    | 2.82           | 29%                     | 324                    |      |
| 2012 | 740267    | Black River         | Mercury    | 0.73           | 61%                     | 174                    |      |

| YEAR | STORET ID | Waterbody Name         | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------|------------|---------------|-------------------------|------------------------|------|
| 2007 | 740267    | Black River            | Phosphorus | 76,000.00     | 24%                     | 324                    |      |
| 2012 | 740267    | Black River            | Phosphorus | 14,235.00     | 41%                     | 174                    |      |
| 2007 | 740267    | Black River            | TSS        | 39,500,000.00 | 29%                     | 324                    |      |
| 2012 | 740267    | Black River            | TSS        | 2,886,420.00  | 23%                     | 174                    |      |
| 2006 | 750273    | upper St. Joseph River | Chloride   | 37,700,000.00 | 600%                    | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Chloride   | 34,600,000.00 | 5%                      | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | Chromium   | 650.00        | 4400%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Chromium   | 880.00        | 86%                     | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | Copper     | 1,390.00      | 1600%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Copper     | 1,220.00      | 8%                      | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | Lead       | 612.00        | 4900%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Lead       | 597.00        | 28%                     | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | Mercury    | 3.38          | 4300%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Mercury    | 3.39          | 36%                     | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | Phosphorus | 54,500.00     | 1600%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | Phosphorus | 63,900.00     | 9%                      | 2500                   |      |
| 2006 | 750273    | upper St. Joseph River | TSS        | 10,300,000.00 | 4700%                   | 1680                   |      |
| 2010 | 750273    | upper St. Joseph River | TSS        | 13,200,000.00 | 18%                     | 2500                   |      |
| 2004 | 770073    | Manistique River       | Chloride   | 4,848,464.00  | 3%                      | 2580                   |      |
| 2009 | 770073    | Manistique River       | Chloride   | 3,320,000.00  | 9%                      | 1638                   |      |
| 2011 | 770073    | Manistique River       | Chloride   | 4,674,826.00  | 5%                      | 1938                   |      |
| 2004 | 770073    | Manistique River       | Chromium   | 1,095.00      | 20%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | Chromium   | 667.00        | 9%                      | 1638                   |      |
| 2011 | 770073    | Manistique River       | Chromium   | 1,057.00      | 11%                     | 1938                   |      |
| 2004 | 770073    | Manistique River       | Copper     | 1,019.00      | 13%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | Copper     | 602.00        | 16%                     | 1638                   |      |
| 2011 | 770073    | Manistique River       | Copper     | 818.00        | 8%                      | 1938                   |      |
| 2004 | 770073    | Manistique River       | Lead       | 620.00        | 32%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | Lead       | 245.00        | 19%                     | 1638                   |      |
| 2011 | 770073    | Manistique River       | Lead       | 416.00        | 35%                     | 1938                   |      |
| 2004 | 770073    | Manistique River       | Mercury    | 8.00          | 19%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | Mercury    | 5.13          | 26%                     | 1638                   |      |
| 2011 | 770073    | Manistique River       | Mercury    | 6.62          | 37%                     | 1938                   |      |
| 2004 | 770073    | Manistique River       | Phosphorus | 48,910.00     | 19%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | Phosphorus | 26,600.00     | 12%                     | 1638                   |      |
| 2011 | 770073    | Manistique River       | Phosphorus | 45,935.00     | 35%                     | 1938                   |      |
| 2004 | 770073    | Manistique River       | TSS        | 16,705,472.00 | 33%                     | 2580                   |      |
| 2009 | 770073    | Manistique River       | TSS        | 8,850,000.00  | 26%                     | 1638                   |      |
| 2011 | 770073    | Manistique River       | TSS        | 30,613,379.00 | 73%                     | 1938                   |      |

| YEAR | STORET ID | Waterbody Name | Parameter  | Mean kg/year  | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------|------------|---------------|-------------------------|------------------------|------|
| 2005 | 820070    | River Rouge    | Chloride   | 23,900,000.00 | 20%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Chloride   | 53,500,000.00 | 3%                      | 426                    |      |
| 2005 | 820070    | River Rouge    | Chromium   | 405.00        | 29%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Chromium   | 832.00        | 23%                     | 426                    |      |
| 2005 | 820070    | River Rouge    | Copper     | 873.00        | 11%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Copper     | 1,330.00      | 13%                     | 426                    |      |
| 2005 | 820070    | River Rouge    | Lead       | 686.00        | 28%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Lead       | 999.00        | 18%                     | 426                    |      |
| 2005 | 820070    | River Rouge    | Mercury    | 1.12          | 16%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Mercury    | 1.92          | 20%                     | 426                    |      |
| 2005 | 820070    | River Rouge    | Phosphorus | 21,100.00     | 16%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | Phosphorus | 46,900.00     | 11%                     | 426                    |      |
| 2005 | 820070    | River Rouge    | TSS        | 4,790,000.00  | 23%                     | 316                    |      |
| 2010 | 820070    | River Rouge    | TSS        | 10,100,000.00 | 25%                     | 426                    |      |

**NOTES:**

- ‡ A typo was corrected here. The load and mean period flow were labeled as being for the St. Clair River (downstream) in Roush (2013), however it is believed that the waterbody name listed here should have been "Black River" instead.

Appendix A-4. Loading Estimates for the WCMP Connecting Channels, 2001 - 2008; in order by STORET, parameter, and then year. Kg/year = kilograms per year; cfs = cubic feet per second.

| YEAR | STORET ID | Waterbody Name       | Parameter | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|-----------|----------------|-------------------------|------------------------|------|
| 2002 | 170139    | St. Marys (upstream) | Cadmium   | 657.00         | 55%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Cadmium   | 36.50          | 178%                    | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Cadmium   | 620.00         | 6%                      | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Cadmium   | 630.00         | 7%                      | 80484                  |      |
| 2002 | 170139    | St. Marys (upstream) | Chloride  | 125,598,252.00 | 33%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Chloride  | 184,389,240.00 | 59%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Chloride  | 141,046,439.00 | 1%                      | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Chloride  | 134,000,000.00 | 15%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Chloride  | 107,000,000.00 | 16%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Chloride  | 2,520,000.00   | 28%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Chloride  | 99,400,000.00  | 26%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Chromium  | 4,088.00       | 142%                    | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Chromium  | 8,923.00       | 58%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Chromium  | 6,351.00       | 38%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Chromium  | 8,030.00       | 105%                    | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Chromium  | 14,900.00      | 44%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Chromium  | 483.00         | 28%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Chromium  | 20,500.00      | 47%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Copper    | 57,414.00      | 5%                      | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Copper    | 57,670.00      | 5%                      | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Copper    | 60,480.00      | 6%                      | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Copper    | 66,900.00      | 10%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Copper    | 53,300.00      | 3%                      | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Copper    | 1,440.00       | 6%                      | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Copper    | 60,900.00      | 10%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Lead      | 3,540.00       | 66%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Lead      | 3,615.00       | 37%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Lead      | 2,673.00       | 21%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Lead      | 4,330.00       | 75%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Lead      | 3,540.00       | 48%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Lead      | 76.30          | 49%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Lead      | 3,550.00       | 77%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Mercury   | 36.50          | 31%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Mercury   | 18.00          | 39%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Mercury   | 23.00          | 33%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Mercury   | 24.50          | 32%                     | 80484                  |      |

| YEAR | STORET ID | Waterbody Name       | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------|------------|----------------|-------------------------|------------------------|------|
| 2006 | 170139    | St. Marys (upstream) | Mercury    | 36.10          | 74%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Mercury    | 0.67           | 44%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Mercury    | 20.60          | 18%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Nickel     | 20,148.00      | 28%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Nickel     | 23,908.00      | 14%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Nickel     | 19,991.00      | 9%                      | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Nickel     | 26,600.00      | 32%                     | 80484                  |      |
| 2002 | 170139    | St. Marys (upstream) | Nitrate    | 20,495,772.00  | 6%                      | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Nitrate    | 18,704,425.00  | 9%                      | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Nitrate    | 21,329,598.00  | 4%                      | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Nitrate    | 21,400,000.00  | 4%                      | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Nitrate    | 17,000,000.00  | 4%                      | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Nitrate    | 486,000.00     | 5%                      | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Nitrate    | 19,500,000.00  | 5%                      | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Phosphorus | 344,629.00     | 32%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Phosphorus | 343,785.00     | 34%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Phosphorus | 570,933.00     | 16%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | Phosphorus | 526,000.00     | 26%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | Phosphorus | 436,000.00     | 33%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | Phosphorus | 6,230.00       | 69%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | Phosphorus | 248,000.00     | 41%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | TKN        | 7,911,740.00   | 13%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | TKN        | 10,458,345.00  | 26%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | TKN        | 14,369,210.00  | 20%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | TKN        | 10,100,000.00  | 21%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | TKN        | 9,510,000.00   | 29%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | TKN        | 197,000.00     | 13%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | TKN        | 8,260,000.00   | 9%                      | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | TSS        | 206,903,900.00 | 29%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | TSS        | 171,557,300.00 | 49%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | TSS        | 185,644,256.00 | 48%                     | 79000                  |      |
| 2005 | 170139    | St. Marys (upstream) | TSS        | 261,000,000.00 | 51%                     | 80484                  |      |
| 2006 | 170139    | St. Marys (upstream) | TSS        | 89,300,000.00  | 87%                     | 66700                  |      |
| 2007 | 170139    | St. Marys (upstream) | TSS        | 3,400,000.00   | 52%                     | 62860                  | *    |
| 2008 | 170139    | St. Marys (upstream) | TSS        | 209,000,000.00 | 27%                     | 72300                  |      |
| 2002 | 170139    | St. Marys (upstream) | Zinc       | 66,211.00      | 48%                     | 77000                  |      |
| 2003 | 170139    | St. Marys (upstream) | Zinc       | 45,625.00      | 45%                     | 72200                  |      |
| 2004 | 170139    | St. Marys (upstream) | Zinc       | 73,060.00      | 45%                     | 79000                  |      |



| YEAR | STORET ID | Waterbody Name         | Parameter | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------|-----------|----------------|-------------------------|------------------------|------|
| 2005 | 170139    | St. Marys (upstream)   | Zinc      | 127,000.00     | 43%                     | 80484                  |      |
| 2002 | 170140    | St. Marys (downstream) | Cadmium   | 584.00         | 53%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Cadmium   | 36.60          | 275%                    | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Cadmium   | 730.00         | 10%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Cadmium   | 649.00         | 7%                      | 80484                  |      |
| 2002 | 170140    | St. Marys (downstream) | Chloride  | 125,801,010.00 | 18%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Chloride  | 171,734,325.00 | 36%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Chloride  | 131,064,200.00 | 15%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Chloride  | 136,000,000.00 | 11%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Chloride  | 104,000,000.00 | 18%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Chloride  | 3,210,000.00   | 22%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Chloride  | 91,400,000.00  | 28%                     | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Chromium  | 21,280.00      | 35%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Chromium  | 21,900.00      | 7%                      | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Chromium  | 27,412.00      | 28%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Chromium  | 20,300.00      | 37%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Chromium  | 26,900.00      | 12%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Chromium  | 908.00         | 16%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Chromium  | 30,400.00      | 7%                      | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Copper    | 70,920.00      | 14%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Copper    | 61,320.00      | 6%                      | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Copper    | 68,839.00      | 7%                      | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Copper    | 72,600.00      | 5%                      | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Copper    | 59,800.00      | 3%                      | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Copper    | 1,640.00       | 4%                      | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Copper    | 65,200.00      | 2%                      | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Lead      | 8,724.00       | 18%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Lead      | 6,789.00       | 9%                      | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Lead      | 8,870.00       | 25%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Lead      | 8,340.00       | 21%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Lead      | 6,770.00       | 12%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Lead      | 185.00         | 13%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Lead      | 6,150.00       | 14%                     | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Mercury   | 28.00          | 23%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Mercury   | 22.00          | 20%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Mercury   | 32.00          | 27%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Mercury   | 26.10          | 10%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Mercury   | 24.30          | 14%                     | 66700                  |      |

| YEAR | STORET ID | Waterbody Name         | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------|------------|----------------|-------------------------|------------------------|------|
| 2007 | 170140    | St. Marys (downstream) | Mercury    | 0.67           | 21%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Mercury    | 26.10          | 25%                     | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Nickel     | 31,171.00      | 21%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Nickel     | 29,054.00      | 10%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Nickel     | 32,594.00      | 15%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Nickel     | 39,100.00      | 5%                      | 80484                  |      |
| 2002 | 170140    | St. Marys (downstream) | Nitrate    | 20,328,700.00  | 5%                      | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Nitrate    | 18,393,810.00  | 6%                      | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Nitrate    | 21,172,847.00  | 3%                      | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Nitrate    | 21,100,000.00  | 3%                      | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Nitrate    | 17,900,000.00  | 6%                      | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Nitrate    | 459,000.00     | 4%                      | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Nitrate    | 19,100,000.00  | 4%                      | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Phosphorus | 608,126.00     | 16%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Phosphorus | 536,185.00     | 5%                      | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Phosphorus | 706,786.00     | 17%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Phosphorus | 742,000.00     | 19%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | Phosphorus | 545,000.00     | 20%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | Phosphorus | 12,600.00      | 33%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | Phosphorus | 393,000.00     | 18%                     | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | TKN        | 8,600,020.00   | 7%                      | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | TKN        | 9,408,240.00   | 16%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | TKN        | 15,334,270.00  | 37%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | TKN        | 10,700,000.00  | 16%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | TKN        | 8,350,000.00   | 17%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | TKN        | 237,000.00     | 43%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | TKN        | 8,010,000.00   | 8%                      | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | TSS        | 344,302,930.00 | 31%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | TSS        | 191,672,450.00 | 40%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | TSS        | 273,206,369.00 | 43%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | TSS        | 250,000,000.00 | 38%                     | 80484                  |      |
| 2006 | 170140    | St. Marys (downstream) | TSS        | 193,000,000.00 | 49%                     | 66700                  |      |
| 2007 | 170140    | St. Marys (downstream) | TSS        | 7,750,000.00   | 48%                     | 62860                  | *    |
| 2008 | 170140    | St. Marys (downstream) | TSS        | 336,000,000.00 | 1000%                   | 72300                  |      |
| 2002 | 170140    | St. Marys (downstream) | Zinc       | 121,545.00     | 27%                     | 77000                  |      |
| 2003 | 170140    | St. Marys (downstream) | Zinc       | 46,720.00      | 16%                     | 72200                  |      |
| 2004 | 170140    | St. Marys (downstream) | Zinc       | 82,256.00      | 22%                     | 79000                  |      |
| 2005 | 170140    | St. Marys (downstream) | Zinc       | 118,000.00     | 16%                     | 80484                  |      |

| YEAR | STORET ID | Waterbody Name               | Parameter | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------------|-----------|------------------|-------------------------|------------------------|------|
| 2002 | 740016    | St. Clair River (downstream) | Cadmium   | 1,168.00         | 48%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Cadmium   | 219.00           | 128%                    | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Cadmium   | 1,022.00         | 12%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Cadmium   | 1,130.00         | 46%                     | 168121                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Chloride  | 1,000,521,210.00 | 6%                      | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Chloride  | 1,169,687,760.00 | 22%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Chloride  | 941,956,157.00   | 8%                      | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Chloride  | 1,110,000,000.00 | 14%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Chloride  | 976,000,000.00   | 6%                      | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Chloride  | 896,000,000.00   | 5%                      | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Chloride  | 1,060,000,000.00 | 12%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Chromium  | 31,244.00        | 78%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Chromium  | 25,188.00        | 25%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Chromium  | 29,820.00        | 20%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Chromium  | 21,800.00        | 47%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Chromium  | 39,000.00        | 21%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Chromium  | 69,500.00        | 28%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Chromium  | 60,600.00        | 17%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Copper    | 91,104.00        | 20%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Copper    | 88,148.00        | 15%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Copper    | 91,980.00        | 12%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Copper    | 109,000.00       | 17%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Copper    | 109,000.00       | 26%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Copper    | 90,300.00        | 9%                      | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Copper    | 88,600.00        | 7%                      | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Lead      | 26,207.00        | 81%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Lead      | 12,446.00        | 29%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Lead      | 16,023.00        | 26%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Lead      | 16,200.00        | 66%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Lead      | 11,900.00        | 19%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Lead      | 12,500.00        | 51%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Lead      | 11,300.00        | 40%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Mercury   | 73.00            | 61%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Mercury   | 36.60            | 28%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Mercury   | 73.00            | 24%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Mercury   | 70.90            | 46%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Mercury   | 79.00            | 24%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Mercury   | 56.30            | 26%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Mercury   | 63.70            | 26%                     | 165000                 |      |

| YEAR | STORET ID | Waterbody Name               | Parameter  | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|------------------------------|------------|----------------|-------------------------|------------------------|------|
| 2002 | 740016    | St. Clair River (downstream) | Nickel     | 142,094.00     | 16%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Nickel     | 127,750.00     | 12%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Nickel     | 132,240.00     | 18%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Nickel     | 139,000.00     | 16%                     | 168121                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Nitrate    | 54,602,024.00  | 4%                      | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Nitrate    | 46,713,898.00  | 9%                      | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Nitrate    | 51,048,718.00  | 17%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Nitrate    | 51,200,000.00  | 6%                      | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Nitrate    | 51,100,000.00  | 11%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Nitrate    | 46,700,000.00  | 9%                      | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Nitrate    | 46,600,000.00  | 9%                      | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Phosphorus | 1,415,105.00   | 48%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Phosphorus | 1,086,970.00   | 27%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Phosphorus | 1,492,485.00   | 23%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Phosphorus | 1,510,000.00   | 48%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | Phosphorus | 1,240,000.00   | 15%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | Phosphorus | 1,210,000.00   | 33%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | Phosphorus | 1,100,000.00   | 51%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | TKN        | 22,690,206.00  | 7%                      | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | TKN        | 31,243,635.00  | 24%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | TKN        | 40,706,187.00  | 34%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | TKN        | 28,600,000.00  | 23%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | TKN        | 19,800,000.00  | 7%                      | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | TKN        | 24,400,000.00  | 26%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | TKN        | 21,100,000.00  | 22%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | TSS        | 597,385,580.00 | 42%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | TSS        | 322,272,735.00 | 23%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | TSS        | 590,518,498.00 | 45%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | TSS        | 927,000,000.00 | 65%                     | 168121                 |      |
| 2006 | 740016    | St. Clair River (downstream) | TSS        | 640,000,000.00 | 29%                     | 164100                 |      |
| 2007 | 740016    | St. Clair River (downstream) | TSS        | 612,000,000.00 | 71%                     | 160000                 |      |
| 2008 | 740016    | St. Clair River (downstream) | TSS        | 525,000,000.00 | 55%                     | 165000                 |      |
| 2002 | 740016    | St. Clair River (downstream) | Zinc       | 162,096.00     | 67%                     | 173000                 |      |
| 2003 | 740016    | St. Clair River (downstream) | Zinc       | 120,450.00     | 22%                     | 159000                 |      |
| 2004 | 740016    | St. Clair River (downstream) | Zinc       | 201,699.00     | 35%                     | 158000                 |      |
| 2005 | 740016    | St. Clair River (downstream) | Zinc       | 166,000.00     | 45%                     | 168121                 |      |
| 2002 | 740376    | St. Clair River (upstream)   | Cadmium    | 912.00         | 66%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream)   | Cadmium    | 0.00           | 0%                      | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream)   | Cadmium    | 730.00         | 7%                      | 158000                 |      |

| YEAR | STORET ID | Waterbody Name             | Parameter | Mean kg/year   | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------------|-----------|----------------|-------------------------|------------------------|------|
| 2005 | 740376    | St. Clair River (upstream) | Cadmium   | 659.00         | 21%                     | 168121                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Chloride  | 982,999,896.00 | 6%                      | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Chloride  | 968,779,715.00 | 9%                      | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Chloride  | 905,674,500.00 | 8%                      | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Chloride  | 945,000,000.00 | 6%                      | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Chloride  | 935,000,000.00 | 6%                      | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Chloride  | 878,000,000.00 | 4%                      | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Chloride  | 998,000,000.00 | 8%                      | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Chromium  | 12,762.00      | 42%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Chromium  | 9,083.00       | 39%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Chromium  | 16,152.00      | 13%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Chromium  | 7,290.00       | 79%                     | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Chromium  | 27,600.00      | 17%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Chromium  | 59,700.00      | 25%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Chromium  | 41,800.00      | 40%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Copper    | 64,831.00      | 8%                      | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Copper    | 63,838.00      | 15%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Copper    | 64,204.00      | 11%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Copper    | 77,400.00      | 10%                     | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Copper    | 86,600.00      | 33%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Copper    | 70,100.00      | 13%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Copper    | 70,300.00      | 6%                      | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Lead      | 5,220.00       | 46%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Lead      | 4,672.00       | 38%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Lead      | 5,366.00       | 53%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Lead      | 4,150.00       | 58%                     | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Lead      | 5,000.00       | 56%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Lead      | 6,940.00       | 67%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Lead      | 4,860.00       | 60%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Mercury   | 47.00          | 13%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Mercury   | 45.00          | 23%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Mercury   | 36.50          | 45%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Mercury   | 64.70          | 75%                     | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Mercury   | 50.60          | 9%                      | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Mercury   | 48.70          | 24%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Mercury   | 47.40          | 30%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Nickel    | 119,229.00     | 6%                      | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Nickel    | 100,403.00     | 7%                      | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Nickel    | 104,390.00     | 21%                     | 158000                 |      |

| YEAR | STORET ID | Waterbody Name             | Parameter  | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------------|------------|------------------|-------------------------|------------------------|------|
| 2005 | 740376    | St. Clair River (upstream) | Nickel     | 111,000.00       | 3%                      | 168121                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Nitrate    | 51,047,670.00    | 5%                      | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Nitrate    | 45,292.00        | 11%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Nitrate    | 48,026,700.00    | 13%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Nitrate    | 49,300,000.00    | 7%                      | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Nitrate    | 50,000,000.00    | 6%                      | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Nitrate    | 45,000,000.00    | 6%                      | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Nitrate    | 44,700,000.00    | 4%                      | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Phosphorus | 513,372.00       | 45%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Phosphorus | 815,637.00       | 45%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Phosphorus | 819,644.00       | 33%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Phosphorus | 2,880,000.00     | 151%                    | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | Phosphorus | 689,000.00       | 12%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | Phosphorus | 666,000.00       | 35%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | Phosphorus | 543,000.00       | 51%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | TKN        | 20,287,446.00    | 7%                      | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | TKN        | 36,653,848.00    | 38%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | TKN        | 31,996,861.00    | 10%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | TKN        | 38,200,000.00    | 58%                     | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | TKN        | 23,200,000.00    | 17%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | TKN        | 23,700,000.00    | 27%                     | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | TKN        | 21,500,000.00    | 20%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | TSS        | 346,010,510.00   | 21%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | TSS        | 384,778,255.00   | 50%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | TSS        | 431,300,242.00   | 66%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | TSS        | 258,000,000.00   | 110%                    | 168121                 |      |
| 2006 | 740376    | St. Clair River (upstream) | TSS        | 259,000,000.00   | 58%                     | 164100                 |      |
| 2007 | 740376    | St. Clair River (upstream) | TSS        | 379,000,000.00   | 114%                    | 160000                 |      |
| 2008 | 740376    | St. Clair River (upstream) | TSS        | 284,000,000.00   | 92%                     | 165000                 |      |
| 2002 | 740376    | St. Clair River (upstream) | Zinc       | 64,924.00        | 28%                     | 173000                 |      |
| 2003 | 740376    | St. Clair River (upstream) | Zinc       | 111,434.00       | 44%                     | 159000                 |      |
| 2004 | 740376    | St. Clair River (upstream) | Zinc       | 109,614.00       | 29%                     | 158000                 |      |
| 2005 | 740376    | St. Clair River (upstream) | Zinc       | 109,000.00       | 55%                     | 168121                 |      |
| 2002 | 820017    | Detroit River (downstream) | Cadmium    | 1,417.00         | 18%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Cadmium    | 409.00           | 95%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Cadmium    | 1,679.00         | 11%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Cadmium    | 2,480.00         | 51%                     | 179002                 |      |
| 2002 | 820017    | Detroit River (downstream) | Chloride   | 1,284,871,175.00 | 7%                      | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Chloride   | 1,339,574,674.00 | 14%                     | 172000                 |      |

| YEAR | STORET ID | Waterbody Name             | Parameter | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------------|-----------|------------------|-------------------------|------------------------|------|
| 2004 | 820017    | Detroit River (downstream) | Chloride  | 1,330,370,701.00 | 6%                      | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Chloride  | 1,400,000,000.00 | 29%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Chloride  | 1,480,000,000.00 | 15%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Chloride  | 1,340,000,000.00 | 13%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Chloride  | 2,550,000,000.00 | 73%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Chromium  | 368.00           | 20%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Chromium  | 47,450.00        | 27%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Chromium  | 47,085.00        | 18%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Chromium  | 70,100.00        | 98%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Chromium  | 55,200.00        | 25%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Chromium  | 97,300.00        | 8%                      | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Chromium  | 69,200.00        | 19%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Copper    | 130,670.00       | 18%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Copper    | 128,845.00       | 17%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Copper    | 129,940.00       | 7%                      | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Copper    | 176,000.00       | 38%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Copper    | 139,000.00       | 15%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Copper    | 130,000.00       | 9%                      | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Copper    | 112,000.00       | 10%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Lead      | 41,062.00        | 21%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Lead      | 50,857.00        | 30%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Lead      | 44,530.00        | 16%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Lead      | 76,900.00        | 81%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Lead      | 37,900.00        | 28%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Lead      | 47,700.00        | 19%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Lead      | 30,700.00        | 10%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Mercury   | 239.00           | 24%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Mercury   | 416.00           | 43%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Mercury   | 328.00           | 32%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Mercury   | 409.00           | 52%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Mercury   | 271.00           | 19%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Mercury   | 289.00           | 25%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Mercury   | 193.00           | 25%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Nickel    | 158,501.00       | 11%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Nickel    | 161,406.00       | 14%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Nickel    | 176,660.00       | 17%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Nickel    | 221,000.00       | 41%                     | 179002                 |      |
| 2002 | 820017    | Detroit River (downstream) | Nitrate   | 57,336,390.00    | 15%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Nitrate   | 55,268,592.00    | 38%                     | 172000                 |      |

| YEAR | STORET ID | Waterbody Name             | Parameter  | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|----------------------------|------------|------------------|-------------------------|------------------------|------|
| 2004 | 820017    | Detroit River (downstream) | Nitrate    | 56,439,314.00    | 9%                      | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Nitrate    | 49,100,000.00    | 11%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Nitrate    | 53,000,000.00    | 8%                      | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Nitrate    | 48,000,000.00    | 9%                      | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Nitrate    | 45,400,000.00    | 15%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Phosphorus | 2,227,411.00     | 13%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Phosphorus | 2,597,960.00     | 16%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Phosphorus | 2,591,208.00     | 13%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Phosphorus | 3,950,000.00     | 57%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | Phosphorus | 2,280,000.00     | 11%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | Phosphorus | 2,400,000.00     | 21%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | Phosphorus | 2,010,000.00     | 9%                      | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | TKN        | 32,588,550.00    | 9%                      | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | TKN        | 35,199,505.00    | 14%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | TKN        | 53,256,529.00    | 37%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | TKN        | 41,400,000.00    | 20%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | TKN        | 33,900,000.00    | 11%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | TKN        | 32,200,000.00    | 12%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | TKN        | 32,800,000.00    | 27%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | TSS        | 951,773,088.00   | 40%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | TSS        | 1,178,932,421.00 | 32%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | TSS        | 955,331,655.00   | 46%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | TSS        | 1,930,000,000.00 | 74%                     | 179002                 |      |
| 2006 | 820017    | Detroit River (downstream) | TSS        | 1,190,000,000.00 | 32%                     | 176300                 |      |
| 2007 | 820017    | Detroit River (downstream) | TSS        | 958,000,000.00   | 33%                     | 172000                 |      |
| 2008 | 820017    | Detroit River (downstream) | TSS        | 661,000,000.00   | 27%                     | 179000                 |      |
| 2002 | 820017    | Detroit River (downstream) | Zinc       | 267,046.00       | 25%                     | 183000                 |      |
| 2003 | 820017    | Detroit River (downstream) | Zinc       | 229,882.00       | 31%                     | 172000                 |      |
| 2004 | 820017    | Detroit River (downstream) | Zinc       | 319,740.00       | 27%                     | 184000                 |      |
| 2005 | 820017    | Detroit River (downstream) | Zinc       | 410,000.00       | 58%                     | 179002                 |      |
| 2002 | 820414    | Detroit River (upstream)   | Cadmium    | 1,168.00         | 73%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream)   | Cadmium    | 548.00           | 128%                    | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream)   | Cadmium    | 1,545.00         | 23%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream)   | Cadmium    | 1,220.00         | 19%                     | 180536                 |      |
| 2002 | 820414    | Detroit River (upstream)   | Chloride   | 1,086,547,539.00 | 5%                      | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream)   | Chloride   | 1,151,590,221.00 | 14%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream)   | Chloride   | 1,112,970,447.00 | 11%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream)   | Chloride   | 1,050,000,000.00 | 7%                      | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream)   | Chloride   | 1,220,000,000.00 | 23%                     | 176300                 |      |



| YEAR | STORET ID | Waterbody Name           | Parameter | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|--------------------------|-----------|------------------|-------------------------|------------------------|------|
| 2007 | 820414    | Detroit River (upstream) | Chloride  | 1,030,000,000.00 | 8%                      | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Chloride  | 1,670,000,000.00 | 56%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Chromium  | 44,895.00        | 66%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Chromium  | 64,678.00        | 96%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Chromium  | 58,364.00        | 47%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Chromium  | 24,700.00        | 40%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Chromium  | 59,600.00        | 28%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | Chromium  | 173,000.00       | 70%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Chromium  | 62,300.00        | 13%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Copper    | 129,027.00       | 12%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Copper    | 133,809.00       | 49%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Copper    | 136,108.00       | 24%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Copper    | 124,000.00       | 15%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Copper    | 165,000.00       | 37%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | Copper    | 189,000.00       | 54%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Copper    | 110,000.00       | 14%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Lead      | 47,085.00        | 62%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Lead      | 68,912.00        | 109%                    | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Lead      | 53,876.00        | 46%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Lead      | 34,100.00        | 25%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Lead      | 38,400.00        | 34%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | Lead      | 111,000.00       | 92%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Lead      | 33,400.00        | 60%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Mercury   | 511.00           | 71%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Mercury   | 1,241.00         | 135%                    | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Mercury   | 720.00           | 27%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Mercury   | 383.00           | 39%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Mercury   | 460.00           | 27%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | Mercury   | 1,060.00         | 101%                    | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Mercury   | 346.00           | 57%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Nickel    | 163,848.00       | 2%                      | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Nickel    | 174,032.00       | 46%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Nickel    | 176,652.00       | 23%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Nickel    | 157,000.00       | 7%                      | 180536                 |      |
| 2002 | 820414    | Detroit River (upstream) | Nitrate   | 59,130.00        | 22%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Nitrate   | 47,107,242.00    | 17%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Nitrate   | 59,431,403.00    | 22%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Nitrate   | 54,900,000.00    | 19%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Nitrate   | 73,500,000.00    | 63%                     | 176300                 |      |

| YEAR | STORET ID | Waterbody Name           | Parameter  | Mean kg/year     | 95% Confidence Interval | Mean Period Flow (cfs) | Note |
|------|-----------|--------------------------|------------|------------------|-------------------------|------------------------|------|
| 2007 | 820414    | Detroit River (upstream) | Nitrate    | 54,200,000.00    | 32%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Nitrate    | 47,000,000.00    | 9%                      | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Phosphorus | 1,949,481.00     | 20%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Phosphorus | 2,634,388.00     | 70%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Phosphorus | 3,319,565.00     | 61%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Phosphorus | 1,870,000.00     | 12%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | Phosphorus | 2,060,000.00     | 32%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | Phosphorus | 4,950,000.00     | 96%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | Phosphorus | 1,860,000.00     | 56%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | TKN        | 28,279,064.00    | 5%                      | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | TKN        | 37,191,054.00    | 22%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | TKN        | 59,499,562.00    | 81%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | TKN        | 29,900,000.00    | 14%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | TKN        | 28,500,000.00    | 18%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | TKN        | 35,000,000.00    | 29%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | TKN        | 28,000,000.00    | 22%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | TSS        | 1,289,465,257.00 | 23%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | TSS        | 2,240,217,211.00 | 131%                    | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | TSS        | 1,396,206,990.00 | 35%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | TSS        | 874,000,000.00   | 65%                     | 180536                 |      |
| 2006 | 820414    | Detroit River (upstream) | TSS        | 1,190,000,000.00 | 33%                     | 176300                 |      |
| 2007 | 820414    | Detroit River (upstream) | TSS        | 2,930,000,000.00 | 99%                     | 173000                 |      |
| 2008 | 820414    | Detroit River (upstream) | TSS        | 962,000,000.00   | 75%                     | 179000                 |      |
| 2002 | 820414    | Detroit River (upstream) | Zinc       | 206,955.00       | 46%                     | 183000                 |      |
| 2003 | 820414    | Detroit River (upstream) | Zinc       | 274,407.00       | 88%                     | 172000                 |      |
| 2004 | 820414    | Detroit River (upstream) | Zinc       | 250,067.00       | 33%                     | 184000                 |      |
| 2005 | 820414    | Detroit River (upstream) | Zinc       | 195,000.00       | 21%                     | 180536                 |      |

**NOTES:**

- \* Converted the mean period flow of 1780 (the value that was in originally in Roush [2013], which appeared to be cubic meters per second [cms]) over to 62860 cubic feet per second (cfs) by multiplying by 35.3147667. These particular loads (in mean kg/year) appear inaccurate compared with earlier years, perhaps due to possible use of mean period flow in the wrong units, thus these loads (from Roush [2013]) are shown in italics here. Refer to Roush (2013) for the original numbers.

Appendix A-5. Summary of the percent of quality assurance samples (e.g., field blanks [FB], replicates [R]) that exceeded the WCMP's 2017 QA/QC criteria during years 2012-2014 to illustrate which parameters tended to get flagged the most often. The criteria\* used (i.e., thresholds above which field blanks and replicates would be flagged) are detailed in the WCMP's Quality Assurance Project Plan (QAPP) (MDEQ, 2017 [see Appendix D]). Note: In 2012, the WCMP began adding descriptive comments to its database to identify potential suspect values based upon these criteria. Prior to 2012, however, these comments were not consistently added to the database. Therefore, there potentially could have been inconsistencies in what data were excluded pre-2012 versus post-2012, had they been excluded.

| PROB SITES 2012-2014 QC CHECK |           |   |                   |    |           |      |
|-------------------------------|-----------|---|-------------------|----|-----------|------|
| Parameter                     | # Flagged |   | Total # 2012-2014 |    | % Flagged |      |
|                               | FB        | R | FB                | R  | FB        | R    |
| Chloride                      | 0         | 0 | 38                | 65 | 0.0       | 0.0  |
| DOC                           | 12        | 0 | 38                | 65 | 31.6      | 0.0  |
| TOC                           |           |   |                   |    |           |      |
| Sulfate                       | 0         | 2 | 38                | 65 | 0.0       | 3.1  |
| Total P                       | 1         | 0 | 38                | 65 | 2.6       | 0.0  |
| Total Ortho P                 |           |   |                   |    |           |      |
| TSS                           | 5         | 7 | 38                | 65 | 13.2      | 10.8 |
| Hardness                      | 0         | 0 | 38                | 65 | 0.0       | 0.0  |
| Nitrate                       |           |   |                   |    |           |      |
| Nitrate + Nitrite             |           |   |                   |    |           |      |
| Nitrite                       |           |   |                   |    |           |      |
| TKN                           |           |   |                   |    |           |      |
| Ammonia                       |           |   |                   |    |           |      |
| Cadmium                       | 5         | 0 | 60                | 86 | 8.3       | 0.0  |
| Chromium                      | 1         | 9 | 60                | 72 | 1.7       | 12.5 |
| Copper                        | 2         | 2 | 60                | 65 | 3.3       | 3.1  |
| Lead                          | 1         | 9 | 59                | 64 | 1.7       | 14.1 |
| Nickel                        | 2         | 2 | 59                | 71 | 3.4       | 2.8  |
| Zinc                          | 3         | 8 | 59                | 66 | 5.1       | 12.1 |
| Mercury                       | 7         | 3 | 46                | 64 | 15.2      | 4.7  |

| WCMP TRIBS SITES 2012-2013 QC CHECK |           |     |                   |    |           |     |
|-------------------------------------|-----------|-----|-------------------|----|-----------|-----|
| Parameter                           | # Flagged |     | Total # 2012-2013 |    | % Flagged |     |
|                                     | FB        | R   | FB                | R  | FB        | R   |
| Chloride                            | ---       | --- |                   |    |           |     |
| DOC                                 | n/a       | n/a |                   |    |           |     |
| TOC                                 | ---       | --- |                   |    |           |     |
| Sulfate                             | ---       | --- |                   |    |           |     |
| Total P                             | ---       | --- |                   |    |           |     |
| Total Ortho P                       | ---       | --- |                   |    |           |     |
| TSS                                 | ---       | --- |                   |    |           |     |
| Hardness                            | ---       | --- |                   |    |           |     |
| Nitrate                             | 1         |     | 30                |    | 3.3       | --- |
| Nitrate + Nitrite                   | ---       | --- |                   |    |           |     |
| Nitrite                             | ---       | --- |                   |    |           |     |
| TKN                                 | ---       | --- |                   |    |           |     |
| Ammonia                             | ---       | --- |                   |    |           |     |
| Cadmium                             | ---       | --- |                   |    |           |     |
| Chromium                            | ---       | 3   | ---               | 43 | ---       | 7.0 |
| Copper                              | ---       | --- |                   |    |           |     |
| Lead                                | ---       | 2   | ---               | 43 | ---       | 4.7 |
| Nickel                              | ---       | --- |                   |    |           |     |
| Zinc                                | ---       | --- |                   |    |           |     |
| Mercury                             | ---       | --- |                   |    |           |     |

| WCMP Bays/Channels SITES 2012-2014 QC CHECK |           |   |                   |    |           |     |
|---------------------------------------------|-----------|---|-------------------|----|-----------|-----|
| Parameter                                   | # Flagged |   | Total # 2012-2014 |    | % Flagged |     |
|                                             | FB        | R | FB                | R  | FB        | R   |
| Chloride                                    | 2         | 0 | 23                | 41 | 8.7       | 0.0 |
| DOC                                         |           |   |                   |    |           |     |
| TOC                                         | 0         | 1 | 23                | 41 | 0.0       | 2.4 |
| Total Sulfate                               | 1         | 2 | 23                | 41 | 4.3       | 4.9 |
| Total Phosphorus                            | 1         | 3 | 23                | 41 | 4.3       | 7.3 |
| Total Ortho Phosphate                       | 1         | 1 | 23                | 41 | 4.3       | 2.4 |
| Total Suspended Solids                      | 5         | 2 | 23                | 41 | 21.7      | 4.9 |
| Hardness                                    |           |   |                   |    |           |     |
| Nitrate                                     |           |   |                   |    |           |     |
| Nitrate + Nitrite                           | 0         | 4 | 23                | 41 | 0.0       | 9.8 |
| Total Nitrite                               | 2         | 2 | 23                | 41 | 8.7       | 4.9 |
| Total Kjeldahl Nitrogen                     | 1         | 2 | 23                | 41 | 4.3       | 4.9 |
| Total Ammonia                               | 1         | 1 | 23                | 41 | 4.3       | 2.4 |
| Cadmium                                     |           |   |                   |    |           |     |
| Chromium                                    | 2         | 0 | 30                | 20 | 6.7       | 0.0 |
| Copper                                      | 1         | 0 | 30                | 20 | 3.3       | 0.0 |
| Lead                                        | 1         | 1 | 30                | 20 | 3.3       | 5.0 |
| Nickel                                      |           |   |                   |    |           |     |
| Zinc                                        |           |   |                   |    |           |     |
| Mercury                                     | 4         | 1 | 19                | 22 | 21.1      | 4.5 |

\* MDEQ/WCMP Criteria for Flagging Data (for more details see MDEQ, 2017 [see Appendix D]):

field blank > investigative result

field blank > 1/5 investigative result

field blank > reporting limit (RL)

replicate and investigative sample pair RPD exceeds allowable RPD (only applies if at least one of the samples in the pair is > RL)

# Appendix B-1. WCMP Probabilistic Sites Monitored from 2005-2014<sup>1</sup>.

| STORET | PROB_ID | RIVER                             | LOCATION                 | LAT.     | LONG.    | ECOREGION | STREAM ORDER | DOMINANT GEOLOGY                         | DOMINANT LAND COVER | DEVELOP. PRESENCE SCALE |
|--------|---------|-----------------------------------|--------------------------|----------|----------|-----------|--------------|------------------------------------------|---------------------|-------------------------|
| 10088  | 276     | South Branch Pine River           | unnamed road             | 44.5771  | -83.4937 | NLAF      | 3            | End Moraines _ Med_textured till         | ForestDeciduous     | 1                       |
| 10130  | 484     | Vincent Creek                     | Hubbard Lake Rd          | 44.7411  | -83.5268 | NLAF      | 1            | Glacial Till _ Course_textured           | ForestDeciduous     | 0                       |
| 20081  | 254     | Dexter Creek                      | M-67                     | 46.22034 | -86.9285 | NLAF      | 1            | Glacial Till _ Medium_textured           | ForestDeciduous     | 0                       |
| 20164  | 176     | West Branch Whitefish Creek       | two-track just off US 41 | 46.2431  | -87.0838 | NLAF      | 3            | Glacial Till _ Medium_textured           | WetlandsWoody       | 0                       |
| 30147  | 323     | Rabbit River                      | u/s 18th St.             | 42.6425  | -85.7217 | SMNI      | 4            | Outwash _ Glacial                        | CultivatedCrops     | 2                       |
| 30653  | 99      | Unnamed Trib to Kalamazoo River   | d/s 30th St.             | 42.48048 | -85.8367 | SMNI      | 1            | Glacial Till _ Medium_textured           | CultivatedCrops     | 1                       |
| 30654  | 291     | Rabbit River                      | u/s 26th St.             | 42.6929  | -85.7994 | SMNI      | 4            | Outwash _ Glacial                        | CultivatedCrops     | 1                       |
| 30663  | 355     | Barber Creek                      | d/s Baseline Rd          | 42.42057 | -86.0613 | SMNI      | 2            | Lacustrine _ Sand & Gravel               | ForestDeciduous     | 1                       |
| 30699  | 387     | Macatawa River (South Branch)     | d/s M-40                 | 42.7298  | -86.0549 | SMNI      | 3            | End Moraines _ Fine_textured till        | CultivatedCrops     | 1                       |
| 40159  | 72      | North Branch Thunder Bay River    | u/s Wikaryasz Rd.        | 45.17844 | -83.6263 | NLAF      | 3            | Glacial Till _ Course_textured           | WetlandsWoody       | 1                       |
| 40188  | 402     | Wolf Creek                        | Schultz Rd               | 44.946   | -83.6393 | NLAF      | 4            | Glacial Till _ Course_textured           | ForestDeciduous     | 0                       |
| 40189  | 230     | Bean Creek                        | Standen Rd               | 45.0855  | -83.6939 | NLAF      | 3            | Glacial Till _ Course_textured           | WetlandsWoody       | 1                       |
| 40190  | 482     | Thunder Bay River                 | Salina Rd                | 45.0822  | -83.7584 | NLAF      | 4            | Glacial Till _ Course_textured           | ForestDeciduous     | 1                       |
| 50272  | 12      | Intermediate River                | Harbor St                | 44.973   | -85.2134 | NCHF      | 3            | Glacial Till _ Course_textured           | ForestDeciduous     | 1                       |
| 60120  | 58      | Chief Creek Drain                 | alongside Bessinger Rd.  | 44.08461 | -83.7405 | NLAF      | 2            | Lacustrine _ Sand & Gravel               | CultivatedCrops     | 2                       |
| 60121  | 309     | Big Creek                         | u/s Lenter Rd.           | 44.0559  | -83.7664 | NLAF      | 3            | Lacustrine _ Sand & Gravel               | ForestDeciduous     | 1                       |
| 60140  | 132     | Baum Drain                        | d/s Tonkey Rd            | 44.06275 | -83.6681 | NLAF      | 1            | Lacustrine _ Clay & Silt                 | ForestDeciduous     | 0                       |
| 70085  | 98      | Slate River                       | d/s Silver Rd.           | 46.80888 | -88.2309 | NLAF      | 2            | Glacial Till _ Thin to Disc over Bedrock | ForestDeciduous     | 0                       |
| 80280  | 33      | Quaker Brook                      | Bivens Rd                | 42.582   | -85.087  | SMNI      | 3            | Glacial Till _ Medium_textured           | CultivatedCrops     | 1                       |
| 90288  | 261     | Unnamed trib to Quinicassee River | Russell Rd               | 43.5368  | -83.7088 | HELP      | 3            | Lacustrine _ Sand & Gravel               | CultivatedCrops     | 2                       |

<sup>1</sup> Location changes made prior to first sampling event at a site (i.e. differed slightly from EPA list) are not indicated within table. Location changes made following at least one sampling event are listed in Table 1-2. Develop. Presence Scale (0 = development absent, 1 = low intensity, 2 = medium intensity, 3 = high intensity as defined in Methods).

| STORET | PROB_ID | RIVER                                  | LOCATION                      | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                       | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|----------------------------------------|-------------------------------|----------|----------|---------------|-----------------|-------------------------------------------|---------------------------|-------------------------------|
| 90289  | 17      | Hembling Drain                         | Mackinac Rd                   | 43.66833 | -83.9886 | HELP          | 2               | Lacustrine _ Sand<br>& Gravel             | CultivatedCrops           | 2                             |
| 90294  | 533     | Squaconning Creek                      | d/s M84                       | 43.55558 | -83.9508 | HELP          | 3               | Glacial Till _<br>Fine_textured           | CultivatedCrops           | 2                             |
| 100246 | 461     | Betsie River                           | end of Patterson<br>Rd        | 44.56059 | -86.0512 | NCHF          | 3               | Outwash _ Glacial                         | ForestDeciduous           | 1                             |
| 110745 | 75      | Saint Joseph River                     | end of Natures<br>Rd.         | 41.84674 | -86.2676 | SMNI          | 4               | Outwash _ Glacial                         | CultivatedCrops           | 1                             |
| 110746 | 307     | Pipestone Creek                        | u/s Watson Rd.                | 42.05786 | -86.3547 | SMNI          | 3               | End Moraines _<br>Coarse_textured till    | CultivatedCrops           | 1                             |
| 120228 | 83      | Tallahassee Creek                      | u/s Warren Rd.                | 41.83978 | -84.9451 | SMNI          | 2               | Outwash _ Glacial                         | CultivatedCrops           | 1                             |
| 120229 | 299     | South Branch Hog<br>Creek              | u/s Jonesville Rd.            | 41.98524 | -84.8637 | SMNI          | 3               | End Moraines _<br>Coarse_textured till    | CultivatedCrops           | 1                             |
| 120247 | 427     | Trib to Cold Creek                     | State Rd                      | 41.9563  | -84.9858 | SMNI          | 1               | Glacial Till _<br>Coarse_textured         | CultivatedCrops           | 3                             |
| 120248 | 555     | Burnett Creek                          | u/s Wagner Road               | 42.07124 | -85.1088 | SMNI          | 2               | Glacial Till _<br>Coarse_textured         | CultivatedCrops           | 1                             |
| 130357 | 117     | Pine Creek                             | u/s South R Drive             | 42.1115  | -85.2518 | SMNI          | 3               | Outwash _ Glacial                         | CultivatedCrops           | 0                             |
| 130389 | 5       | Ackely Creek                           | 15 Mile Rd                    | 42.399   | -85.0054 | SMNI          | 2               | End Moraines _<br>Coarse_textured till    | WetlandsWoody             | 1                             |
| 130390 | 275     | Wanadoga Creek                         | Huntington Rd                 | 42.3845  | -85.1282 | SMNI          | 3               | End Moraines _<br>Coarse_textured till    | CultivatedCrops           | 1                             |
| 130391 | 81      | Eaton and Baker<br>Drain               | u/s J Drive North             | 42.32009 | -84.8678 | SMNI          | 1               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 0                             |
| 130409 | 237     | South Branch<br>Kalamazoo River        | 29 Mile Rd                    | 42.13117 | -84.7314 | SMNI          | 3               | End Moraines _<br>Coarse_textured till    | CultivatedCrops           | 1                             |
| 130410 | 467     | Nottawa Creek                          | d/s 10 Mile Rd                | 42.1956  | -85.1031 | SMNI          | 2               | Outwash _ Glacial                         | CultivatedCrops           | 1                             |
| 130411 | 531     | Wabascon Creek                         | u/s Mason Avenue              | 42.35685 | -85.2412 | SMNI          | 2               | End Moraines _<br>Coarse_textured till    | ForestDeciduous           | 1                             |
| 140189 | 499     | Pokagon Creek                          | Old Mill Rd                   | 41.89671 | -86.0977 | SMNI          | 2               | Ice_contact<br>outwash sand and<br>gravel | CultivatedCrops           | 2                             |
| 140198 | 563     | Unnamed Tributary<br>to Dowagiac River | M-51                          | 42.00768 | -86.1081 | SMNI          | 2               | Glacial Till _<br>Coarse_textured         | CultivatedCrops           | 3                             |
| 160231 | 50      | Stewart Creek                          | unnamed road                  | 45.4174  | -84.2741 | NLAF          | 1               | Glacial Till _<br>Coarse_textured         | WetlandsWoody             | 1                             |
| 160259 | 186     | West Branch<br>Sturgeon River          | Coffron Rd                    | 45.2716  | -84.6021 | NLAF          | 3               | End Moraines _<br>Coarse_textured till    | ForestDeciduous           | 0                             |
| 160260 | 394     | Mullet Creek                           | Indian Trails Rd              | 45.56    | -84.6365 | NLAF          | 2               | Glacial Till _<br>Coarse_textured         | ForestDeciduous           | 1                             |
| 160261 | 522     | Unnamed Trib to<br>Laperell Creek      | d/s Wing Road                 | 45.59969 | -84.508  | NLAF          | 1               | Lacustrine _ Sand<br>& Gravel             | CultivatedCrops           | 1                             |
| 170145 | 360     | Ankodosh Creek                         | Lake Superior<br>Shoreline Rd | 46.4769  | -84.9995 | NLAF          | 2               | End Moraines _<br>Coarse_textured till    | ForestDeciduous           | 0                             |

| STORET | PROB_ID | RIVER                                    | LOCATION               | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|------------------------------------------|------------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 170240 | 282     | Schweinger Creek                         | O J Miller Rd          | 46.1795  | -85.0519 | NLAF          | 1               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | WetlandsWoody             | 0                             |
| 170269 | 144     | Biscuit Creek                            | d/s off Leanard<br>Rd  | 46.21825 | -84.7336 | NLAF          | 2               | Lacustrine _ Sand<br>& Gravel                  | WetlandsWoody             | 0                             |
| 170270 | 122     | Hendrie River<br>headwaters              | M-123                  | 46.25142 | -85.01   | NLAF          | 1               | Outwash _ Glacial                              | WetlandsWoody             | 1                             |
| 170290 | 164     | McMahen Creek                            | Goldade Rd             | 46.359   | -84.6347 | NLAF          | 1               | Lacustrine _ Sand<br>& Gravel                  | WetlandsWoody             | 0                             |
| 170291 | 442     | Munuscong River                          | Kallio Rd              | 46.24582 | -84.5384 | NLAF          | 1               | Glacial Till _<br>Course_textured              | WetlandsWoody             | 1                             |
| 180146 | 351     | West Branch Clam<br>River                | Haskell Lake Rd        | 44.11738 | -85.0599 | NLAF          | 3               | End Moraines _<br>Coarse_textured till         | CultivatedCrops           | 1                             |
| 180184 | 107     | Spike Horn Creek (N<br>B Tobacco River)  | off Hoover Rd          | 43.94585 | -84.6289 | NLAF          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 180185 | 421     | Overton Creek (aka<br>Littlefield Creek) | d/s Surrey Rd          | 43.8567  | -84.8907 | NLAF          | 1               | Glacial Till _<br>Course_textured              | DevelopedOpen<br>Space    | 1                             |
| 180186 | 211     | South Branch<br>Tobacco River            | Tobacco Rd             | 43.8454  | -84.6535 | HELP          | 3               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 180190 | 543     | N B Tobacco River                        | Athey Avenue           | 43.95463 | -84.6684 | NLAF          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 190065 | 361     | Stony Creek                              | Jason Rd               | 42.9149  | -84.5825 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 190147 | 85      | Little Maple River                       | u/s Taft Rd.           | 42.95739 | -84.4273 | SMNI          | 3               | End Moraines _<br>Med_textured till            | CultivatedCrops           | 0                             |
| 190186 | 235     | Dallas and Bengal<br>Drain               | Forest Hill Rd         | 43.0453  | -84.6813 | SMNI          | 2               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 190187 | 489     | Remey Chandler<br>Drain                  | d/s Howe Rd            | 42.84412 | -84.5379 | SMNI          | 2               | End Moraines _<br>Med_textured till            | DevelopedLowI<br>ntensity | 3                             |
| 200170 | 468     | Au Sable River                           | end of Red Dog<br>Rd   | 44.66993 | -84.3813 | NLAF          | 4               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 210251 | 56      | Tenmile Creek                            | d/s B 13               | 45.79351 | -87.2993 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 210301 | 130     | Tacoosh River                            | Perkins 30.5 Rd        | 45.9781  | -87.0691 | NLAF          | 1               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 1                             |
| 210318 | 222     | Sturgeon River                           | two-track off US<br>2  | 45.90941 | -86.7023 | NLAF          | 3               | Outwash _ Glacial                              | WetlandsWoody             | 0                             |
| 210319 | 480     | Little Fishdam River                     | 0.25 Ln                | 45.90441 | -86.5581 | NLAF          | 1               | Lacustrine _ Sand<br>& Gravel                  | WetlandsWoody             | 0                             |
| 220125 | 256     | Pine Creek                               | Calumet Mine Rd        | 45.93225 | -87.9702 | NLAF          | 2               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |
| 220127 | 76      | Hamilton Creek                           | d/s Beaver Pete<br>Rd. | 45.76591 | -87.7089 | NLAF          | 1               | Glacial Till _<br>Medium_textured              | ForestDeciduous           | 0                             |
| 220131 | 150     | West Branch<br>Sturgeon River            | Groveland Mine<br>Rd   | 45.9999  | -87.9017 | NLAF          | 2               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |

| STORET | PROB_ID | RIVER                                                 | LOCATION                         | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|-------------------------------------------------------|----------------------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 220144 | 500     | West Branch<br>Sturgeon River                         | footbridge off<br>Browns Lake Rd | 45.92849 | -87.8067 | NLAF          | 3               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |
| 230198 | 69      | Thornapple River                                      | alongside Pinch<br>Hwy.          | 42.65403 | -84.7668 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 230238 | 329     | Butternut Creek                                       | u/s Kinsel Hwy.                  | 42.5967  | -84.8052 | SMNI          | 2               | Outwash _ Glacial                              | CultivatedCrops           | 3                             |
| 240201 | 562     | Bear River                                            | Bear River Park                  | 45.36997 | -84.9646 | NCHF          | 3               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 1                             |
| 250119 | 553     | Shiawassee River                                      | Meier Road                       | 42.81667 | -83.9203 | SMNI          | 4               | End Moraines _<br>Med_textured till            | ForestDeciduous           | 2                             |
| 250486 | 1       | Kearsley Creek                                        | Belsay Rd                        | 43.0406  | -83.5958 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | ForestDeciduous           | 2                             |
| 250533 | 187     | Adams Drain                                           | Torrey Rd                        | 42.815   | -83.7255 | SMNI          | 3               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 2                             |
| 250534 | 385     | Thread Creek                                          | Chambers Rd                      | 42.9969  | -83.6478 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | ForestDeciduous           | 3                             |
| 260105 | 55      | Unnamed Trib to<br>South Branch Little<br>Sugar River | d/s Dassey Rd.                   | 44.04527 | -84.4568 | NLAF          | 2               | Glacial Till _<br>Fine_textured                | PastureHay                | 1                             |
| 260106 | 93      | North Branch<br>Kawkawlin River                       | u/s Klender Rd.                  | 43.86408 | -84.1869 | NLAF          | 2               | End Moraines _<br>Fine_textured till           | ForestDeciduous           | 1                             |
| 260108 | 129     | Sugar River                                           | end of Lennon Rd                 | 44.0502  | -84.3794 | NLAF          | 4               | Glacial Till _<br>Fine_textured                | ForestDeciduous           | 1                             |
| 260138 | 415     | North Branch Cedar<br>River                           | M-18                             | 44.07533 | -84.5717 | NLAF          | 2               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 270180 | 38      | Montgomery Creek                                      | Shore Rd                         | 46.491   | -89.5294 | NLAF          | 1               | Glacial Till _<br>Course_textured              | WetlandsWoody             | 0                             |
| 270187 | 148     | Little Presque Isle<br>River                          | Wolf Mount Rd                    | 46.4187  | -89.7837 | NLAF          | 3               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 270205 | 156     | Black River                                           | end of Harding Rd                | 46.44981 | -90.0171 | NLAF          | 3               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 280416 | 246     | Boardman River                                        | two-track off<br>River Rd        | 44.64782 | -85.5729 | NLAF          | 4               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 290183 | 279     | Pine River                                            | Bridge Ave                       | 43.3875  | -84.6465 | SMNI          | 4               | Glacial Till _<br>Course_textured              | CultivatedCrops           | 1                             |
| 290184 | 21      | Pine Creek                                            | Johnson Rd                       | 43.2337  | -84.6708 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 290206 | 159     | Pine River                                            | Hillis Rd                        | 43.32517 | -84.8442 | NLAF          | 4               | Glacial Till _<br>Course_textured              | CultivatedCrops           | 1                             |
| 290213 | 535     | Bad River                                             | Barry Road                       | 43.28803 | -84.4293 | SMNI          | 3               | Lacustrine _ Clay<br>& Silt                    | CultivatedCrops           | 2                             |
| 300270 | 31      | Unnamed trib to Mill<br>Creek                         | Territorial Rd                   | 41.7083  | -84.3754 | ECBP          | 1               | End Moraines _<br>Med_textured till            | CultivatedCrops           | 1                             |
| 300271 | 23      | Unnamed trib to<br>Carruthers Drain                   | Carpenter Rd                     | 41.7908  | -84.6881 | ECBP          | 1               | End Moraines _<br>Med_textured till            | CultivatedCrops           | 1                             |

| STORET | PROB_ID | RIVER                                               | LOCATION                 | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                  | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|-----------------------------------------------------|--------------------------|----------|----------|---------------|-----------------|--------------------------------------|---------------------------|-------------------------------|
| 300272 | 67      | Unnamed Trib<br>between Devoe Lake<br>and Moon Lake | u/s Waldron Rd.          | 41.83306 | -84.4211 | ECBP          | 2               | End Moraines _<br>Med_textured till  | PastureHay                | 0                             |
| 300274 | 141     | Beebe Creek                                         | Hoxie Rd                 | 41.9565  | -84.5011 | SMNI          | 1               | End Moraines _<br>Med_textured till  | CultivatedCrops           | 1                             |
| 300289 | 491     | East Fork, West<br>Branch St. Joseph<br>River       | Card Rd                  | 41.855   | -84.6778 | SMNI          | 2               | Outwash _ Glacial                    | CultivatedCrops           | 1                             |
| 310460 | 134     | Bart Creek                                          | end of Bear Creek<br>Rd  | 46.89558 | -88.6773 | NLAF          | 3               | End Moraines _<br>Fine_textured till | ForestDeciduous           | 0                             |
| 310462 | 366     | West Branch<br>Sturgeon River                       | L127A                    | 46.8014  | -88.6792 | NLAF          | 4               | Glacial Till _<br>Course_textured    | ForestDeciduous           | 0                             |
| 310508 | 104     | Begunn Creek                                        | u/s M-203                | 47.2472  | -88.5155 | NLAF          | 1               | Glacial Till _<br>Course_textured    | WetlandsWoody             | 3                             |
| 320276 | 260     | Moore Creek                                         | Lackie Rd                | 43.9447  | -83.0844 | HELP          | 3               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 320278 | 100     | Pinnebog River                                      | u/s Port Austin<br>Rd.   | 43.99315 | -83.0758 | HELP          | 4               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 320279 | 324     | Willow Creek                                        | u/s Minnick Rd.          | 43.87126 | -82.8354 | HELP          | 3               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 320325 | 102     | Pinnebog River                                      | u/s Berne Rd             | 43.84428 | -83.1621 | HELP          | 4               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 320326 | 388     | Pigeon River                                        | Pigeon Rd                | 43.82943 | -83.2883 | HELP          | 3               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 320327 | 516     | Elkton Drain                                        | d/s Pigeon Rd            | 43.81941 | -83.1909 | HELP          | 3               | Lacustrine _ Clay<br>& Silt          | CultivatedCrops           | 1                             |
| 330414 | 265     | Western Creek Shaw<br>Branch                        | Olds Rd                  | 42.4353  | -84.3598 | SMNI          | 2               | Glacial Till _<br>Medium_textured    | CultivatedCrops           | 1                             |
| 330434 | 121     | Red Cedar River                                     | d/s Williamston<br>Rd    | 42.68836 | -84.2896 | SMNI          | 4               | Glacial Till _<br>Medium_textured    | PastureHay                | 1                             |
| 330440 | 393     | Willow Creek                                        | d/s College Rd           | 42.5662  | -84.4821 | SMNI          | 2               | Glacial Till _<br>Medium_textured    | CultivatedCrops           | 1                             |
| 330441 | 505     | Dietz Creek                                         | Dennis Rd                | 42.61791 | -84.2114 | SMNI          | 2               | Glacial Till _<br>Medium_textured    | CultivatedCrops           | 1                             |
| 330456 | 127     | Cahaogan Creek                                      | u/s Fitchburg Rd         | 42.44125 | -84.2911 | SMNI          | 3               | Glacial Till _<br>Medium_textured    | CultivatedCrops           | 1                             |
| 340190 | 537     | Goose Creek                                         | Divine Highway           | 42.95778 | -84.8864 | SMNI          | 3               | End Moraines _<br>Med_textured till  | CultivatedCrops           | 0                             |
| 340221 | 253     | Flat River                                          | Bridge St                | 43.10008 | -85.2291 | SMNI          | 4               | Glacial Till _<br>Course_textured    | CultivatedCrops           | 1                             |
| 340225 | 345     | Messer Brook                                        | u/s Vedder Rd.           | 42.76977 | -85.2403 | SMNI          | 2               | End Moraines _<br>Med_textured till  | CultivatedCrops           | 0                             |
| 340242 | 509     | Prairie Creek                                       | M-21 (Blue Water<br>Hwy) | 42.99154 | -85.0287 | SMNI          | 3               | Glacial Till _<br>Fine_textured      | CultivatedCrops           | 1                             |
| 350230 | 356     | Saddler Creek                                       | Partlo Townline<br>Rd    | 44.2496  | -83.6495 | NLAF          | 2               | Lacustrine _ Sand<br>& Gravel        | ForestEvergreen           | 1                             |



| STORET | PROB_ID | RIVER                           | LOCATION                          | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|---------------------------------|-----------------------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 350242 | 216     | Picket Creek                    | snowmobile trail<br>off Vaughn Rd | 44.34587 | -83.6814 | NLAF          | 2               | Lacustrine _ Sand<br>& Gravel                  | ForestEvergreen           | 1                             |
| 350243 | 452     | Buck Creek                      | two-track off<br>Fargo Rd         | 44.4194  | -83.5695 | NLAF          | 1               | Lacustrine _ Sand<br>& Gravel                  | ForestEvergreen           | 1                             |
| 350244 | 463     | Johnson Creek                   | u/s Hottis Rd                     | 44.19122 | -83.8541 | NLAF          | 3               | End Moraines _<br>Fine_textured till           | CultivatedCrops           | 1                             |
| 360146 | 270     | Fence River                     | Spot Lake Rd                      | 46.2454  | -88.1604 | NLAF          | 4               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 360147 | 94      | South Branch Paint<br>River     | d/s Federal Forest<br>Rd. 3270    | 46.22533 | -88.8685 | NLAF          | 2               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 360148 | 310     | North Branch Paint<br>River     | u/s Gibbs City Rd.                | 46.30626 | -88.8089 | NLAF          | 3               | End Moraines _<br>Coarse_textured till         | ForestEvergreen           | 0                             |
| 360153 | 374     | Stager Creek                    | u/s Stager Lake<br>Rd             | 45.98972 | -88.3472 | NLAF          | 1               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 370027 | 45      | Chippewa River                  | Mission Rd                        | 43.62362 | -84.7681 | HELP          | 4               | Lacustrine _ Sand<br>& Gravel                  | DevelopedMedI<br>ntensity | 3                             |
| 370118 | 311     | Stony Brook                     | u/s Woodruff Rd.                  | 43.56639 | -84.9674 | NLAF          | 1               | Outwash _ Glacial                              | CultivatedCrops           | 0                             |
| 370119 | 115     | Salt Creek                      | d/s Fremont Rd                    | 43.49705 | -84.6918 | SMNI          | 2               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 370138 | 439     | Chippewa River                  | Vandecar Rd                       | 43.58809 | -84.8884 | SMNI          | 4               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 370139 | 219     | Delaney Creek                   | Coleman Rd                        | 43.75277 | -85.0453 | NLAF          | 2               | End Moraines _<br>Coarse_textured till         | PastureHay                | 0                             |
| 370140 | 453     | Chippewa River                  | u/s Chippewa Rd                   | 43.62304 | -84.6298 | HELP          | 4               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 370151 | 549     | N B Chippewa River              | Meridian Road                     | 43.73904 | -84.8486 | SMNI          | 3               | Glacial Till _<br>Medium_textured              | ForestDeciduous           | 0                             |
| 380260 | 521     | Grand River                     | off end of State<br>Road          | 42.40251 | -84.4286 | SMNI          | 4               | Outwash _ Glacial                              | WetlandsWoody             | 2                             |
| 380484 | 166     | Trib to Peterson<br>Lake        | Vrooman Rd                        | 42.19477 | -84.4557 | SMNI          | 1               | Outwash _ Glacial                              | DevelopedOpen<br>Space    | 1                             |
| 380485 | 444     | Trib to Grand River             | d/s Meridian Rd                   | 42.10804 | -84.3621 | SMNI          | 1               | Glacial Till _<br>Course_textured              | CultivatedCrops           | 1                             |
| 390610 | 171     | Johnson Drain                   | d/s 40th St                       | 42.1945  | -85.3752 | SMNI          | 2               | Outwash _ Glacial                              | CultivatedCrops           | 1                             |
| 390611 | 403     | Gull Creek                      | G Ave                             | 42.33495 | -85.4018 | SMNI          | 2               | Outwash _ Glacial                              | CultivatedCrops           | 1                             |
| 400136 | 367     | Taylor Creek                    | South Branch Rd                   | 44.675   | -85.3234 | NLAF          | 2               | Outwash _ Glacial                              | ForestEvergreen           | 1                             |
| 400141 | 13      | Manistee River                  | Sharon Rd SE                      | 44.58835 | -85.0782 | NLAF          | 4               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 410708 | 317     | Unnamed Trib to<br>Indian Lakes | d/s Indian Lakes<br>Rd.           | 43.19685 | -85.6506 | SMNI          | 1               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 410767 | 201     | Mill Creek                      | u/s M-37                          | 43.0901  | -85.691  | SMNI          | 2               | Glacial Till _<br>Medium_textured              | CultivatedCrops           | 1                             |
| 420144 | 96      | Silver Creek                    | u/s Five Mile<br>Point Rd.        | 47.39974 | -88.3331 | NLAF          | 1               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |

| STORET | PROB_ID | RIVER                              | LOCATION                   | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|------------------------------------|----------------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 420166 | 140     | Garden Brook                       | u/s Manganese Rd           | 47.46395 | -87.888  | NLAF          | 2               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |
| 420226 | 526     | Jacobs Creek                       | M26                        | 47.42814 | -88.2377 | NLAF          | 1               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |
| 430558 | 541     | Little Manistee River              | Kings Highway              | 44.03456 | -85.7205 | NLAF          | 2               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 430625 | 103     | Pere Marquette River               | Pine Hollow (boat<br>ramp) | 43.92225 | -85.977  | NLAF          | 4               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 430626 | 445     | Baldwin River                      | Forman Road                | 43.92583 | -85.8015 | NLAF          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 440222 | 91      | South Branch Flint<br>River        | u/s Stanley Rd.            | 43.11425 | -83.3713 | SMNI          | 4               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 2                             |
| 440223 | 305     | Bottom Creek                       | off Jefferson Rd.          | 43.21021 | -83.1956 | SMNI          | 2               | End Moraines _<br>Coarse_textured till         | CultivatedCrops           | 0                             |
| 440248 | 565     | Whigville Creek                    | upstream Casey<br>Road     | 42.92201 | -83.1849 | SMNI          | 1               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 0                             |
| 460354 | 331     | Black Creek                        | d/s Elliot Hwy.            | 41.775   | -84.1375 | ECBP          | 2               | End Moraines _<br>Fine_textured till           | CultivatedCrops           | 1                             |
| 460399 | 348     | South Branch River<br>Raisin       | u/s Seneca Hwy.            | 41.85523 | -84.1794 | ECBP          | 2               | Glacial Till _<br>Fine_textured                | CultivatedCrops           | 1                             |
| 460400 | 126     | Black Creek                        | d/s Scott Hwy              | 41.8134  | -83.944  | HELP          | 4               | Lacustrine _ Clay<br>& Silt                    | CultivatedCrops           | 0                             |
| 470574 | 25      | Marion Iosco Drain                 | Lange Rd                   | 42.5748  | -84.0296 | SMNI          | 2               | End Moraines _<br>Coarse_textured till         | PastureHay                | 1                             |
| 470581 | 52      | South Ore Creek                    | u/s Hilton Rd.             | 42.54936 | -83.7785 | SMNI          | 2               | Outwash _ Glacial                              | WetlandsEmerg<br>entHerb  | 2                             |
| 470645 | 441     | Honey Creek                        | LakeLands Rd               | 42.4675  | -83.9909 | SMNI          | 2               | Outwash _ Glacial                              | PastureHay                | 1                             |
| 490149 | 314     | Munuscong River                    | d/s Rutledge Rd.           | 46.13626 | -84.4037 | NLAF          | 3               | Lacustrine _ Clay<br>& Silt                    | WetlandsWoody             | 1                             |
| 490213 | 244     | Furlong Creek                      | u/s M-117                  | 46.1371  | -85.5736 | NLAF          | 2               | Peat and muck                                  | WetlandsWoody             | 0                             |
| 490214 | 538     | Unnamed Trib to<br>Borgstrom Creek | Strickler Truck<br>Trail   | 46.13096 | -85.3166 | NLAF          | 1               | Lacustrine _ Sand<br>& Gravel                  | ForestDeciduous           | 0                             |
| 500528 | 35      | Gloede Ditch                       | Garfield Road              | 42.6476  | -82.9569 | HELP          | 3               | Lacustrine _ Sand<br>& Gravel                  | DevelopedLowI<br>ntensity | 3                             |
| 500542 | 353     | Plum Brook                         | d/s 18 Mile Rd             | 42.5925  | -83.0421 | HELP          | 3               | Lacustrine _ Sand<br>& Gravel                  | DevelopedLowI<br>ntensity | 3                             |
| 500573 | 401     | East Pond Creek                    | Pearl Rd                   | 42.8658  | -83.0984 | SMNI          | 2               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 0                             |
| 500574 | 449     | Coon Creek                         | d/s 26 Mile Rd             | 42.7159  | -82.8813 | HELP          | 4               | Lacustrine _ Clay<br>& Silt                    | CultivatedCrops           | 1                             |
| 500582 | 529     | Stony Creek                        | Park Road                  | 42.75228 | -83.0735 | SMNI          | 2               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 510267 | 217     | Cedar Creek                        | Creamery Rd                | 44.37595 | -85.9722 | NCHF          | 3               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |

| STORET | PROB_ID | RIVER                                        | LOCATION                        | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|----------------------------------------------|---------------------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 520399 | 286     | Lindsey Creek                                | Little West Rd                  | 46.11383 | -87.398  | NLAF          | 1               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 520445 | 64      | Yellow Dog River                             | u/s Yellow Dog<br>Rd.           | 46.72747 | -87.8728 | NLAF          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 520462 | 382     | Big Garlic River                             | u/s County Road<br>510          | 46.6853  | -87.7006 | NLAF          | 1               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 520463 | 138     | Little W B Escanaba<br>River                 | Little West Rd                  | 46.1154  | -87.4006 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 520506 | 510     | E B Chocolay River                           | Co Rd 545                       | 46.33292 | -87.2617 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 520507 | 472     | Trib to Superior<br>Lakes                    | County Road 601                 | 46.4469  | -87.9315 | NLAF          | 2               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | WetlandsWoody             | 0                             |
| 530275 | 27      | Little Sable River                           | Manales Rd                      | 44.0403  | -86.0501 | NLAF          | 2               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 530297 | 477     | North Branch<br>Lincoln River                | Larson Rd                       | 44.0347  | -86.1411 | SMNI          | 2               | Glacial Till _<br>Fine_textured                | ForestDeciduous           | 0                             |
| 530299 | 557     | Little Manistee River                        | off Riverside<br>Drive          | 44.16433 | -86.087  | NLAF          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 0                             |
| 540182 | 343     | West Branch Little<br>Muskegon River         | d/s Buchanan Rd.                | 43.59037 | -85.2807 | NLAF          | 3               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 540202 | 105     | Betts Creek                                  | d/s Lincoln Rd off<br>220th Ave | 43.6057  | -85.5409 | NLAF          | 2               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 0                             |
| 550177 | 40      | Alder Brook                                  | West Rd                         | 45.6898  | -87.5409 | NLAF          | 1               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 1                             |
| 550178 | 48      | Ten Mile Creek                               | Garbor Rd                       | 45.8718  | -87.4681 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 550179 | 272     | South Branch of<br>West Branch Ford<br>River | M-69                            | 45.929   | -87.5946 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 550186 | 384     | Big Brook                                    | u/s County Road<br>354          | 45.43819 | -87.5299 | NLAF          | 2               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 0                             |
| 550187 | 372     | Little Cedar River                           | d/s 34 Rd                       | 45.60568 | -87.6351 | NLAF          | 3               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 1                             |
| 550212 | 170     | Little River                                 | 6.25 Lane                       | 45.2139  | -87.6331 | NLAF          | 3               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 1                             |
| 550213 | 512     | Kelley Creek                                 | u/s O2 Ln                       | 45.28064 | -87.6204 | NLAF          | 1               | Outwash _ Glacial                              | WetlandsWoody             | 1                             |
| 550214 | 448     | Hays Creek                                   | d/s 25 Rd                       | 45.4776  | -87.5826 | NLAF          | 3               | Glacial Till _<br>Medium_textured              | WetlandsWoody             | 1                             |
| 560204 | 3       | Salt River                                   | Saginaw Rd                      | 43.6962  | -84.4429 | HELP          | 4               | Lacustrine _ Clay<br>& Silt                    | CultivatedCrops           | 1                             |
| 560211 | 191     | Pine River                                   | Porter Rd                       | 43.5171  | -84.4621 | HELP          | 4               | Glacial Till _<br>Course_textured              | CultivatedCrops           | 1                             |
| 560212 | 249     | Chippewa River                               | Meridian Rd                     | 43.5948  | -84.3698 | HELP          | 4               | End Moraines _<br>Coarse_textured till         | CultivatedCrops           | 1                             |
| 580542 | 8       | Macon Creek                                  | Far Rd                          | 41.99163 | -83.7499 | HELP          | 3               | Lacustrine _ Clay<br>& Silt                    | CultivatedCrops           | 1                             |

| STORET | PROB_ID | RIVER                                        | LOCATION              | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                    | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|----------------------------------------------|-----------------------|----------|----------|---------------|-----------------|----------------------------------------|---------------------------|-------------------------------|
| 580543 | 32      | Stony Creek                                  | Exeter Rd             | 42.0229  | -83.4177 | HELP          | 4               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 2                             |
| 580544 | 284     | River Raisin                                 | Deerfield Rd          | 41.9022  | -83.7179 | HELP          | 4               | End Moraines _<br>Fine_textured till   | CultivatedCrops           | 1                             |
| 580546 | 316     | Halfway Creek                                | u/s Consear Rd.       | 41.76988 | -83.6585 | HELP          | 2               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 580557 | 380     | Plum Creek                                   | Kentucky Ave          | 41.90237 | -83.3938 | HELP          | 3               | Lacustrine _ Sand<br>& Gravel          | CultivatedCrops           | 2                             |
| 580591 | 540     | Center Creek                                 | Hickory Road          | 42.05387 | -83.736  | HELP          | 2               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 590314 | 29      | Tamarack Creek                               | Orton St              | 43.3975  | -85.4618 | NLAF          | 3               | Outwash _ Glacial                      | CultivatedCrops           | 1                             |
| 590318 | 375     | Dickerson Creek                              | u/s Briggs Rd         | 43.19666 | -85.1894 | NLAF          | 3               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 590346 | 175     | Dickerson Creek                              | d/s Grow Rd           | 43.1934  | -85.1557 | NLAF          | 3               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 590347 | 503     | Wabasis Creek                                | River Road            | 43.13022 | -85.2476 | SMNI          | 3               | Glacial Till _<br>Medium_textured      | CultivatedCrops           | 1                             |
| 600073 | 274     | Brush Creek                                  | Elizabeth St          | 45.0647  | -83.906  | NLAF          | 2               | Outwash _ Glacial                      | ForestEvergreen           | 1                             |
| 600081 | 154     | Canada Creek                                 | County Road 622       | 45.11577 | -84.1976 | NLAF          | 2               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |
| 620277 | 285     | Cedar Creek                                  | Truman Dr             | 43.809   | -85.8533 | NLAF          | 1               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |
| 620280 | 65      | Unnamed Trib to<br>Five Mile Creek           | d/s Elm Rd.           | 43.60569 | -85.6433 | NLAF          | 1               | Glacial Till _<br>Course_textured      | ForestDeciduous           | 0                             |
| 620281 | 295     | South Branch White<br>River                  | d/s Bingham           | 43.56257 | -85.8622 | NLAF          | 3               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |
| 620282 | 327     | Four Mile Creek                              | u/s 80th St.          | 43.4094  | -85.8604 | NLAF          | 1               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 620284 | 381     | Veenboer Drain                               | d/s Thornapple<br>Ave | 43.30262 | -85.709  | SMNI          | 2               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 620295 | 551     | S B White River                              | d/s Monroe Road       | 43.5909  | -85.7536 | NLAF          | 3               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |
| 620320 | 199     | Trib between<br>Kimball Lk and<br>Ryerson Lk | 48th St               | 43.46725 | -85.8338 | NLAF          | 2               | Outwash _ Glacial                      | CultivatedCrops           | 1                             |
| 620321 | 391     | Trib to Fremont<br>Lake                      | Oak St                | 43.46401 | -85.9572 | SMNI          | 2               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 3                             |
| 620322 | 203     | Williams Creek                               | Baldwin Ave           | 43.4195  | -85.8794 | NLAF          | 1               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 620329 | 525     | Cedar Creek                                  | Woodbridge<br>Avenue  | 43.80662 | -85.8496 | NLAF          | 1               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |
| 630288 | 373     | Shiawassee River                             | Academy Rd            | 42.7922  | -83.6349 | SMNI          | 3               | Glacial Till _<br>Course_textured      | ForestDeciduous           | 1                             |
| 631123 | 111     | Paint Creek Drain                            | Newman Rd             | 42.7964  | -83.2915 | SMNI          | 2               | Outwash _ Glacial                      | ForestDeciduous           | 2                             |
| 631223 | 437     | Kearsley Creek                               | Oakwood Rd            | 42.85874 | -83.4514 | SMNI          | 3               | End Moraines _<br>Coarse_textured till | ForestDeciduous           | 2                             |

| STORET | PROB_ID | RIVER                          | LOCATION             | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                            | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|--------------------------------|----------------------|----------|----------|---------------|-----------------|------------------------------------------------|---------------------------|-------------------------------|
| 631224 | 209     | Sashabaw Creek                 | Maybee Rd            | 42.7211  | -83.3525 | SMNI          | 3               | Outwash _ Glacial                              | DevelopedOpen<br>Space    | 3                             |
| 631225 | 239     | Huron River                    | Wixom Rd             | 42.57432 | -83.5602 | SMNI          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 3                             |
| 631226 | 153     | Trout Creek                    | M-24                 | 42.74111 | -83.246  | SMNI          | 1               | End Moraines _<br>Med_textured till            | WetlandsWoody             | 3                             |
| 640293 | 251     | Flower Creek                   | Flower Rd            | 43.4796  | -86.4469 | SMNI          | 3               | End Moraines _<br>Fine_textured till           | CultivatedCrops           | 1                             |
| 640309 | 139     | North Branch White<br>River    | Hayes Rd             | 43.5699  | -86.21   | SMNI          | 3               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 640333 | 507     | Stony Creek                    | Garfield Rd          | 43.5594  | -86.5069 | SMNI          | 3               | End Moraines _<br>Coarse_textured till         | CultivatedCrops           | 1                             |
| 650105 | 42      | Nester Creek                   | Beach Rd             | 44.2989  | -83.9638 | NLAF          | 1               | End Moraines _<br>Fine_textured till           | WetlandsWoody             | 1                             |
| 650108 | 118     | Wilkins Creek                  | d/s Townline Rd      | 44.40331 | -84.1265 | NLAF          | 2               | End Moraines _<br>Fine_textured till           | ForestDeciduous           | 1                             |
| 660090 | 114     | Trib to W B Firesteel<br>River | d/s M-26             | 46.7853  | -89.0336 | NLAF          | 2               | Lacustrine _ Clay<br>& Silt                    | ForestMixed               | 1                             |
| 660096 | 258     | West Branch<br>Ontonagon River | Norwich Rd           | 46.65321 | -89.3853 | NLAF          | 4               | Glacial Till _<br>Course_textured              | ForestDeciduous           | 0                             |
| 660138 | 2       | West Branch Duck<br>Creek      | L P Walsh Rd         | 46.73633 | -89.5007 | NLAF          | 2               | Lacustrine _ Clay<br>& Silt                    | ForestDeciduous           | 0                             |
| 660140 | 80      | Unnamed Trib to<br>Cedar Creek | d/s Aiport Rd.       | 46.54441 | -89.2926 | NLAF          | 1               | Lacustrine _ Clay<br>& Silt                    | PastureHay                | 0                             |
| 660177 | 386     | Lost Creek                     | South Boundary<br>Rd | 46.75637 | -89.678  | NLAF          | 1               | Glacial Till _ Thin<br>to Disc over<br>Bedrock | ForestDeciduous           | 0                             |
| 660178 | 226     | Halfway River                  | Halfway River Rd     | 46.82117 | -89.4499 | NLAF          | 2               | Lacustrine _ Clay<br>& Silt                    | ForestDeciduous           | 0                             |
| 660179 | 450     | Firesteel River                | M-26                 | 46.79083 | -89.0266 | NLAF          | 3               | Lacustrine _ Sand<br>& Gravel                  | ForestDeciduous           | 0                             |
| 670239 | 137     | Dyer Creek                     | 21 Mile Rd           | 44.11789 | -85.5612 | NLAF          | 1               | Outwash _ Glacial                              | ForestEvergreen           | 0                             |
| 670251 | 413     | North Branch Pine<br>River     | u/s 22 Mile Rd       | 44.13452 | -85.5259 | NLAF          | 3               | End Moraines _<br>Coarse_textured till         | ForestDeciduous           | 1                             |
| 680072 | 82      | Au Sable River                 | off McKinley Rd.     | 44.65914 | -84.0388 | NLAF          | 4               | Outwash _ Glacial                              | ForestDeciduous           | 1                             |
| 700605 | 7       | Pigeon River                   | 108th St             | 42.9328  | -86.0524 | SMNI          | 3               | Lacustrine _ Sand<br>& Gravel                  | CultivatedCrops           | 1                             |
| 700606 | 283     | Rio Grande Creek               | 32nd Ave             | 43.1517  | -85.8704 | SMNI          | 2               | End Moraines _<br>Fine_textured till           | CultivatedCrops           | 1                             |
| 700647 | 165     | Trib to Crockery<br>Creek      | u/s 96th Ave         | 43.05896 | -86.0239 | SMNI          | 1               | Lacustrine _ Sand<br>& Gravel                  | CultivatedCrops           | 1                             |
| 700648 | 451     | Rush Creek                     | 32nd Ave             | 42.8634  | -85.8614 | SMNI          | 2               | End Moraines _<br>Fine_textured till           | CultivatedCrops           | 3                             |
| 700649 | 539     | Little Bass Creek              | 72nd Avenue          | 42.9514  | -85.9627 | SMNI          | 2               | Lacustrine _ Sand<br>& Gravel                  | CultivatedCrops           | 1                             |

| STORET | PROB_ID | RIVER                                 | LOCATION                         | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                    | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|---------------------------------------|----------------------------------|----------|----------|---------------|-----------------|----------------------------------------|---------------------------|-------------------------------|
| 710136 | 266     | Unnamed trib to<br>Little Rainy River | 3 Mile Hwy                       | 45.3107  | -84.1959 | NLAF          | 1               | Glacial Till _<br>Course_textured      | ForestDeciduous           | 1                             |
| 710160 | 224     | Trib to Silver Creek                  | Silver Creek Rd                  | 45.45545 | -84.0453 | NLAF          | 1               | Glacial Till _<br>Course_textured      | ForestDeciduous           | 0                             |
| 710161 | 498     | Little Ocqueoc River                  | Silver Creek Rd                  | 45.4073  | -84.0288 | NLAF          | 2               | Outwash _ Glacial                      | WetlandsWoody             | 0                             |
| 730135 | 37      | Flint River                           | Cresswell Rd                     | 43.31889 | -83.9928 | SMNI          | 4               | Glacial Till _<br>Medium_textured      | CultivatedCrops           | 3                             |
| 730306 | 73      | South Fork Bad<br>River               | end of Ring Rd.                  | 43.26515 | -84.1968 | HELP          | 4               | Lacustrine _ Sand<br>& Gravel          | CultivatedCrops           | 1                             |
| 730337 | 277     | Tittabawassee River                   | Center Rd                        | 43.3918  | -84.016  | HELP          | 1               | Lacustrine _ Sand<br>& Gravel          | ForestDeciduous           | 1                             |
| 730356 | 405     | Bad River                             | Meridian Rd                      | 43.3071  | -84.3688 | HELP          | 3               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 740395 | 383     | Silver Creek                          | u/s Jeddo Rd                     | 43.1491  | -82.6352 | HELP          | 3               | Glacial Till _<br>Fine_textured        | CultivatedCrops           | 1                             |
| 740414 | 255     | Howe Drain                            | Keewahdin Rd                     | 43.039   | -82.478  | HELP          | 3               | End Moraines _<br>Fine_textured till   | CultivatedCrops           | 2                             |
| 740415 | 321     | Belle River                           | u/s Indian Trail                 | 42.77484 | -82.5496 | HELP          | 4               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 740427 | 109     | Mill Creek                            | d/s Mason Rd                     | 43.1241  | -82.8926 | SMNI          | 4               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 740428 | 113     | Swan Creek                            | u/s Ira Rd                       | 42.6813  | -82.6587 | HELP          | 3               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 740448 | 151     | Burtch Creek                          | Babcock Road                     | 43.15204 | -82.5424 | HELP          | 3               | End Moraines _<br>Fine_textured till   | CultivatedCrops           | 1                             |
| 740449 | 185     | North Branch Mill<br>Creek            | u/s Mason Road                   | 43.12402 | -82.8962 | SMNI          | 4               | End Moraines _<br>Coarse_textured till | CultivatedCrops           | 1                             |
| 740450 | 229     | South Branch Pine<br>River            | Bricker Road                     | 42.9912  | -82.7298 | HELP          | 2               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 740451 | 465     | Belle River                           | u/s Boardman<br>Road             | 42.89887 | -82.7605 | HELP          | 4               | Lacustrine _ Clay<br>& Silt            | CultivatedCrops           | 1                             |
| 740466 | 545     | Miccdle Channel St<br>Clair River     | off Middle<br>Channel Drive      | 42.57632 | -82.6553 | HELP          | 2               | Lacustrine _ Clay<br>& Silt            | WetlandsEmerge<br>ntHerb  | 0                             |
| 750285 | 523     | Prairie River                         | McKale Road                      | 41.8747  | -85.37   | SMNI          | 3               | Outwash _ Glacial                      | ForestDeciduous           | 0                             |
| 750331 | 395     | Fawn River                            | u/s Watt Road                    | 41.7746  | -85.3107 | SMNI          | 4               | Outwash _ Glacial                      | CultivatedCrops           | 1                             |
| 750332 | 483     | Flowerfield Creek                     | u/s Main Street<br>(Flowerfield) | 42.06745 | -85.6582 | SMNI          | 2               | Outwash _ Glacial                      | CultivatedCrops           | 1                             |
| 760235 | 364     | Mill Creek                            | Lakeshore Rd                     | 43.6588  | -82.6091 | HELP          | 2               | Glacial Till _<br>Medium_textured      | CultivatedCrops           | 1                             |
| 760249 | 24      | Custer County Drain                   | Forester Rd                      | 43.4789  | -82.8653 | HELP          | 1               | Outwash _ Glacial                      | CultivatedCrops           | 0                             |
| 760257 | 162     | South Fork Cass<br>River              | Freiberger Road                  | 43.65303 | -82.9166 | HELP          | 3               | Peat and muck                          | WetlandsWoody             | 0                             |
| 760258 | 433     | Fletcher Drain                        | Harrington Road                  | 43.27274 | -82.8371 | HELP          | 2               | Glacial Till _<br>Medium_textured      | CultivatedCrops           | 1                             |

| STORET | PROB_ID | RIVER                          | LOCATION                     | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                       | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|--------------------------------|------------------------------|----------|----------|---------------|-----------------|-------------------------------------------|---------------------------|-------------------------------|
| 760259 | 511     | Birch Creek                    | u/s Fisher Road              | 43.16921 | -82.5078 | HELP          | 4               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 1                             |
| 760270 | 556     | S B Cass River                 | Downington Road              | 43.50316 | -83.0284 | HELP          | 4               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 1                             |
| 770118 | 10      | Dead Creek                     | Old Seney Rd                 | 46.3206  | -85.9068 | NLAF          | 1               | Peat and muck                             | WetlandsWoody             | 0                             |
| 770120 | 86      | Manistique River               | u/s Riverside<br>Truck Trail | 46.0858  | -86.06   | NLAF          | 4               | Lacustrine _ Sand<br>& Gravel             | WetlandsWoody             | 0                             |
| 770121 | 330     | Stutts Creek                   | u/s Stutts Truck<br>Trail    | 46.15759 | -86.2778 | NLAF          | 3               | Outwash _ Glacial                         | WetlandsWoody             | 0                             |
| 770163 | 392     | Fox River                      | Fox River<br>Campground      | 46.4002  | -86.0275 | NLAF          | 2               | Outwash _ Glacial                         | ForestDeciduous           | 0                             |
| 770165 | 520     | South Branch Stutts<br>Creek   | Clear Lake Road              | 46.22222 | -86.4194 | NLAF          | 2               | Peat and muck                             | WetlandsWoody             | 0                             |
| 780220 | 257     | Porter Creek                   | Allan Rd                     | 43.1022  | -83.9908 | SMNI          | 3               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 1                             |
| 780245 | 425     | Kanouse Lake Drain             | Bath Road                    | 42.82381 | -84.0007 | SMNI          | 2               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 0                             |
| 780246 | 513     | Misteguay Creek                | off end of Byron<br>Road     | 43.13125 | -83.9489 | HELP          | 4               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 1                             |
| 780247 | 501     | Rush Creek                     | u/s Durand Road              | 42.9992  | -83.9873 | SMNI          | 2               | Glacial Till _<br>Medium_textured         | CultivatedCrops           | 1                             |
| 790190 | 365     | South Branch White<br>Creek    | d/s Cemetery Rd              | 43.43961 | -83.1697 | HELP          | 3               | End Moraines _<br>Med_textured till       | CultivatedCrops           | 0                             |
| 790191 | 133     | Sucker Creek Drain             | u/s Turner Rd                | 43.38313 | -83.2456 | SMNI          | 1               | Outwash _ Glacial                         | CultivatedCrops           | 0                             |
| 790201 | 173     | Millington Creek               | Vassar Rd                    | 43.311   | -83.583  | SMNI          | 2               | End Moraines _<br>Med_textured till       | ForestDeciduous           | 1                             |
| 790202 | 428     | Mud Creek                      | u/s Cemetery Rd              | 43.52189 | -83.1679 | HELP          | 2               | Glacial Till _<br>Course_textured         | CultivatedCrops           | 0                             |
| 790203 | 231     | Elliot Branch (Smith<br>Drain) | Millington Rd                | 43.27959 | -83.672  | HELP          | 2               | End Moraines _<br>Med_textured till       | CultivatedCrops           | 1                             |
| 800581 | 213     | Brush Creek                    | County Road 215              | 42.1471  | -86.0658 | SMNI          | 2               | Outwash _ Glacial                         | CultivatedCrops           | 1                             |
| 800582 | 247     | East Branch Paw<br>Paw River   | d/s Kalamazoo St             | 42.21365 | -85.8926 | SMNI          | 2               | Ice_contact<br>outwash sand and<br>gravel | ForestDeciduous           | 2                             |
| 810007 | 524     | Saline River                   | Dell Road                    | 42.17084 | -83.8258 | ECBP          | 3               | End Moraines _<br>Fine_textured till      | CultivatedCrops           | 1                             |
| 821418 | 377     | Johnson Drain                  | u/s 6 Mile Rd                | 42.40694 | -83.5171 | ECBP          | 3               | End Moraines _<br>Med_textured till       | PastureHay                | 2                             |
| 821522 | 71      | River Rouge                    | d/s Warren Rd.               | 42.34182 | -83.248  | HELP          | 4               | Lacustrine _ Sand<br>& Gravel             | DevelopedLowI<br>ntensity | 3                             |
| 821523 | 332     | Bradshaw Drain                 | d/s Arkona Rd.               | 42.10036 | -83.5114 | HELP          | 3               | Lacustrine _ Sand<br>& Gravel             | CultivatedCrops           | 2                             |
| 821545 | 142     | Fellows Creek                  | Cherry Hill Rd               | 42.30929 | -83.4447 | HELP          | 3               | Lacustrine _ Clay<br>& Silt               | DevelopedLowI<br>ntensity | 3                             |

| STORET | PROB_ID | RIVER             | LOCATION               | LAT.     | LONG.    | ECOREG<br>ION | STREAM<br>ORDER | DOMINANT<br>GEOLOGY                    | DOMINANT<br>LAND<br>COVER | DEVELOP.<br>PRESENCE<br>SCALE |
|--------|---------|-------------------|------------------------|----------|----------|---------------|-----------------|----------------------------------------|---------------------------|-------------------------------|
| 821576 | 481     | Upper River Rouge | Inkster Rd             | 42.4244  | -83.3159 | HELP          | 3               | End Moraines _<br>Med_textured till    | DevelopedLowI<br>ntensity | 3                             |
| 830220 | 87      | Manistee River    | Chase Creek<br>cmpgrnd | 44.48401 | -85.3557 | NLAF          | 4               | Outwash _ Glacial                      | ForestDeciduous           | 0                             |
| 830221 | 333     | Perkins Creek     | d/s 17 Rd.             | 44.31444 | -85.6614 | NLAF          | 1               | End Moraines _<br>Coarse_textured till | ForestDeciduous           | 0                             |
| 830228 | 519     | Manistee River    | off Glenary Rd         | 44.42794 | -85.7086 | NLAF          | 4               | Outwash _ Glacial                      | ForestDeciduous           | 1                             |



Appendix B-2. Site Location Changes from 2005-2014.

| STORET | Stream                                 | Location       | PROB_ID | Latitude<br>(revised) | Longitude<br>(revised) | <u>Replaces</u> PROB ID          | Notes                       |
|--------|----------------------------------------|----------------|---------|-----------------------|------------------------|----------------------------------|-----------------------------|
| 440248 | Whigville Creek                        | u/s Casey Road | 565     | 42.92201              | -83.18495              | 235<br>(Dallas and Bengal Drain) | <i>REPLACEMENT<br/>SITE</i> |
| 140198 | Unnamed Tributary to<br>Dowagiac River | M-51           | 563     | 42.00768              | -86.10810              | 519<br>(Manistee River)          | <i>REPLACEMENT<br/>SITE</i> |

## Michigan Multi-Panel Stream Survey Design

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By Tony Olsen, USEPA  
PROB Site Design

### Description of Sample Design

Please initiate the site selection for a survey design of streams for the state of Michigan.

Target Population: All perennial streams and rivers within Michigan.

Sample Frame: RF3-Alpha with Strahler order added. Restrict to perennial streams. This is the only option if want to use Strahler order in the design.

Reach File Version 3-Alpha (RF3-Alpha) was used as the sampling frame. Streams were selected based on the 1:100,000-scale data set with reaches coded "R" (regular reach), "S" (start/headwater reach), "T" (terminal reach), "N" (non-networked reach), and "W" (wide river - one bank only). For double-line "wide" rivers, only one bank (one side of the channel) was used for measuring and sampling. This was done in lieu of taking the total length of both the left and right banks and dividing by two. Although the sample point will be located on a bank for these features, it is assumed the sample will occur following standard sampling protocols as defined by the study.

The Strahler order classification (Strahler, 1957) of the reaches used for sampling are coded in a preliminary version of RF3-Alpha which resides with the US EPA NHEERL-WED EMAP Design group. The Strahler stream order was calculated and subsequently added to RF3-Alpha via an automated process. No visual inspection of the process was completed. Although the results have errors in the stream ordering, the ordering is generally reliable for lower order streams. No effort is planned or has been taken to correct Strahler stream orders which are incorrectly classified for this version of the RF3-Alpha data set.

For more information on RF3-Alpha, refer to the documentation at <http://www.epa.gov/OWOW/monitoring/rf/rfindex.html>. Link to "Reach File References" for access to the document, "The US EPA Reach File Version 3.0 Alpha Release (RF3-Alpha) Technical Reference".



Survey Design: GRTS for a linear resource with RHO. GRTS: Generalized Random Tessellation Stratified. RHO: Reverse Hierarchical Ordering.

Strata: None

Multi Density Categories: Strahler order categories: 1st, 2nd, 3rd, and 4th+ groups

Panels: 5 annual panels of sites. Each panel will be visited once. Will take 5 years to use all 5 panels.

Expected Sample Size: 250 base sites. 50 sites per panel. Equal number of sites across the 4 Strahler order category groups.

Oversample: 500 sites for a total of 750 sites.

### **Description of Sample Design Output:**

To achieve an expected sample size of sites in the target population, an appropriate sample size was selected for each separate study area. The extra/reserve samples are available as alternate sites for base sites which do not conform to target population rules (e.g. non-wadeable, mis-mapped features), are inaccessible due to safety concerns, or where access is denied by landowners. The design has a base set of 250 samples spread over 5 panels, one panel of 50 sites per year. The design has a 200% oversample, i.e. 500 reserve sites, for a total of 750 potential sample sites.

The sites must be evaluated for use in numerical order. Numerical order is determined by the SiteID. The base sites have an "oversamp" code of "0". The oversample sites ("oversamp" code = 1) should be used, as needed, in numerical order.

For further questions on sampling order, please see contact information at the end of this document.

The following tables show the distribution of the frame information, as well as the sample sites, for each separate design (stratum).

Sums of Multipliers for Sample Design  
MI Peren Streams 2005-2009

| ordcat | Frequency | Percent | Cumulative<br>Frequency | Cumulative<br>Percent |
|--------|-----------|---------|-------------------------|-----------------------|
| 1      | 19088.43  | 25.00   | 19088.43                | 25.00                 |
| 2      | 19084.85  | 25.00   | 38173.27                | 50.00                 |
| 3      | 19085.81  | 25.00   | 57259.08                | 75.00                 |
| 4+     | 19090.75  | 25.00   | 76349.83                | 100.00                |

Mult for Strahler order

| ordmult | Frequency | Percent | Cumulative<br>Frequency | Cumulative<br>Percent |
|---------|-----------|---------|-------------------------|-----------------------|
| 1       | 19088.43  | 25.00   | 19088.43                | 25.00                 |
| 1.575   | 19084.85  | 25.00   | 38173.27                | 50.00                 |
| 2.327   | 19085.81  | 25.00   | 57259.08                | 75.00                 |
| 3.052   | 19090.75  | 25.00   | 76349.83                | 100.00                |

MD\_CATY values for MI Peren Streams 2005-2009  
sums are in meters

| md_caty | numbering<br>scheme for<br>design<br>strata | Mult for<br>Strahler<br>order | ordcat | sum of<br>units | sum of<br>weighted<br>units |
|---------|---------------------------------------------|-------------------------------|--------|-----------------|-----------------------------|
| 1       | 1                                           | 1.000                         | 1      | 19088427.26     | 19088427.26                 |
| 2       | 1                                           | 1.575                         | 2      | 12117363.00     | 19084846.73                 |
| 3       | 1                                           | 2.327                         | 3      | 8201894.45      | 19085808.38                 |
| 4       | 1                                           | 3.052                         | 4+     | 6255159.05      | 19090745.41                 |

## Selected Sites for MI Peren Streams 2005-2009

Table of nest\_id by oversamp

| nest_id                                           |     |     |       |
|---------------------------------------------------|-----|-----|-------|
| oversamp(If 0: routine site; Else a reserve site) |     |     |       |
| Frequency                                         | 0   | 1   | Total |
| 1                                                 | 250 | 500 | 750   |
| Total                                             | 250 | 500 | 750   |

Table of ordcat by oversamp

| ordcat                                            |     |     |       |
|---------------------------------------------------|-----|-----|-------|
| oversamp(If 0: routine site; Else a reserve site) |     |     |       |
| Frequency                                         | 0   | 1   | Total |
| 1                                                 | 65  | 119 | 184   |
| 2                                                 | 62  | 124 | 186   |
| 3                                                 | 62  | 147 | 209   |
| 4+                                                | 61  | 110 | 171   |
| Total                                             | 250 | 500 | 750   |

Table of order by oversamp

| order(Strahler order for stream)                  |     |     |       |
|---------------------------------------------------|-----|-----|-------|
| oversamp(If 0: routine site; Else a reserve site) |     |     |       |
| Frequency                                         | 0   | 1   | Total |
| 1                                                 | 65  | 119 | 184   |
| 2                                                 | 62  | 124 | 186   |
| 3                                                 | 62  | 147 | 209   |
| 4                                                 | 42  | 76  | 118   |
| 5                                                 | 15  | 24  | 39    |
| 6                                                 | 4   | 7   | 11    |
| 7                                                 | 0   | 3   | 3     |
| Total                                             | 250 | 500 | 750   |

The attached comma-delimited, ASCII file (miw05537.csv) has the following variable definitions:

|             |                                                                                 |
|-------------|---------------------------------------------------------------------------------|
| Site_ID     | Sample Identifier assigned to each site<br>14 characters                        |
| Site Name   | Name (if provided)<br>30 characters                                             |
| Long-DD     | Longitude, Decimal Degrees<br>12.6 numeric                                      |
| Lat-DD      | Latitude, Decimal Degrees<br>12.6 numeric                                       |
| Stratum     | Stratum (1 stratum defined in this design)<br>2 integer                         |
| Panel       | Used if Multiple years/seasons/etc. sample<br>1 integer                         |
| Oversamp    | Defines "backup" or "oversample" sites.<br>1 integer                            |
| Division    | Division breaks down panels and expected/replicate sites.<br>1 integer          |
| MD_Cat      | Multi-Density weight category - defined above.<br>2 integer                     |
| Nest_ID     | More than one if multiple levels/classes of samples drawn.<br>1 integer         |
| Nest1       | Defines sites within this nest class (1 = within, 0 = not in)<br>1 integer      |
| Nest1_N     | Expected number of samples for initial design categories.<br>2 integer          |
| Nest1_wt    | Initial Design weight for the site.<br>12.7 numeric                             |
| RF3RCHID    | EPA's River Reach File V.3 Reach ID<br>17 character (numeric with blank spaces) |
| Strahler    | Strahler Order - generated from RF3<br>1 integer                                |
| County      | County Name<br>25 characters                                                    |
| Map24KName  | Map name for 1:24,000 scale map<br>30 characters                                |
| Map100KName | Map name for 1:100,000 scale map<br>30 characters                               |
| Map250KName | Map name for 1:250,000 scale map<br>30 characters                               |
| Eco_3Code   | Omernik Ecoregion Level 3 Code<br>3 integer                                     |

The location information (if provided) is based on the 1927 North American Datum for projection. The Arc/INFO export files, if delivered with these data, have the following projection parameters:

|            |             |
|------------|-------------|
| Projection | Albers      |
| Datum      | NAD27       |
| Spheroid   | Clarke 1866 |
| Units      | Meters      |

|                                     |                     |
|-------------------------------------|---------------------|
| 1 <sup>st</sup> projection parallel | 29 degrees 30' 00"  |
| 2 <sup>nd</sup> projection parallel | 45 degrees 30' 00"  |
| central meridian                    | -96 degrees 00' 00" |
| projection origin                   | 23 degrees 00' 00"  |
| false easting                       | 0.00000             |
| false northing                      | 0.00000             |

### **Description of Statistical Analysis:**

The statistical analysis of the data requires the weighting and stratification variables be used, even if computation of descriptive statistics (means, medians, standard errors, etc.) is all that is desired. After fieldwork and sampling, information on sampled and unsampled sites, along with reasons for non-sampling, need to be used to adjust sample weights. Otherwise, incorrect estimates for the target population will occur. See references for estimation procedures, or contact [emapdesign@mail.cor.epa.gov](mailto:emapdesign@mail.cor.epa.gov).

### **For any questions about these data, please contact:**

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**Bibliography:**

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Appendix C-1. WCMP Great Lakes Tributaries, summarized by STORET. Data summarized from 1999-2013. An asterisk (\*) indicates that sample size for uncensored parameters was determined using Excel since it was not determined by the R statistics package. These sample sizes are shown at the end of this table. Parameters marked by \*\* were summarized using the Turnbull method for interval-censored data analysis. Sites with non-detect samples (i.e., below detection limit) were marked with 'ND'; sites with non-quantifiable samples (i.e., below reporting limit) were marked with 'NQ'. Q1 and Q3 equal the 25th and 75th percentiles, respectively. Rows were ordered by median values.

| <i>Intensive &amp; Integrator Sites</i> | <b>**Total Phosphorus (mg/L)</b> |           |               |           |            |                |
|-----------------------------------------|----------------------------------|-----------|---------------|-----------|------------|----------------|
| <b>Ecoregion / Site Name / STORET</b>   | <b>Min</b>                       | <b>Q1</b> | <b>Median</b> | <b>Q3</b> | <b>Max</b> | <b>samples</b> |
| HE Clinton River 500233                 | 0.050                            | 0.119     | <b>0.145</b>  | 0.192     | 0.540      | 161            |
| HE Flint River 730285                   | 0.049                            | 0.107     | <b>0.135</b>  | 0.169     | 0.730      | 78             |
| SM Grand River (Upper) 340025           | 0.046                            | 0.078     | <b>0.109</b>  | 0.139     | 0.290      | 79             |
| SM Grand River (Lower) 700123           | 0.033                            | 0.086     | <b>0.107</b>  | 0.139     | 0.310      | 174            |
| HE Saginaw River 090177                 | 0.051                            | 0.081     | <b>0.100</b>  | 0.118     | 0.452      | 155            |
| SM Kalamazoo River (Lower) 030077       | 0.024                            | 0.061     | <b>0.079</b>  | 0.102     | 0.380      | 174            |
| HE Cass River 730024                    | 0.030                            | 0.053     | <b>0.077</b>  | 0.097     | 0.260      | 79             |
| HE River Rouge 820070                   | 0.009                            | 0.063     | <b>0.076</b>  | 0.103     | 0.220      | 74             |
| HE River Raisin 580046                  | 0.030                            | 0.050     | <b>0.067</b>  | 0.095     | 0.495      | 78             |
| SM St. Joseph River (Lower) 110628      | 0.027                            | 0.048     | <b>0.065</b>  | 0.085     | 0.400      | 91             |
| NL Pine River 490006                    | 0.026                            | 0.049     | <b>0.061</b>  | 0.098     | 0.390      | 71             |
| HE Black River 740267                   | 0.024                            | 0.047     | <b>0.059</b>  | 0.073     | 0.650      | 48             |
| HE Shiawassee River 730023              | 0.017                            | 0.041     | <b>0.058</b>  | 0.089     | 0.320      | 74             |
| SM Kalamazoo River (Upper) 390598       | 0.023                            | 0.044     | <b>0.058</b>  | 0.086     | 0.173      | 79             |
| HE Tittabawassee River 730025           | 0.026                            | 0.043     | <b>0.057</b>  | 0.079     | 0.177      | 79             |
| HE Huron River 580364                   | 0.018                            | 0.038     | <b>0.050</b>  | 0.062     | 0.090      | 78             |
| NL Ontonagon River 660038               | 0.015                            | 0.027     | <b>0.040</b>  | 0.079     | 1.300      | 71             |
| NL Escanaba River 210102                | 0.006                            | 0.027     | <b>0.037</b>  | 0.047     | 0.188      | 90             |
| SM St. Joseph River (Upper) 750273      | 0.012                            | 0.024     | <b>0.034</b>  | 0.041     | 0.093      | 74             |
| SM Pere Marquette River 530027          | 0.011                            | 0.025     | <b>0.033</b>  | 0.047     | 0.140      | 90             |
| NL Muskegon River (Upper) 670008        | 0.013                            | 0.021     | <b>0.030</b>  | 0.047     | 0.183      | 80             |
| NL Menominee River 550038               | 0.009                            | 0.023     | <b>0.028</b>  | 0.035     | 0.100      | 87             |
| SM Muskegon River (Lower) 610273        | 0.006                            | 0.021     | <b>0.027</b>  | 0.033     | 0.330      | 173            |
| NL Tahquamenon River 170141             | 0.006                            | 0.018     | <b>0.022</b>  | 0.027     | 0.042      | 84             |
| NC Manistee River 510088                | 0.012                            | 0.017     | <b>0.020</b>  | 0.024     | 0.066      | 71             |
| NL Sturgeon River 210032                | NQ                               | 0.013     | <b>0.019</b>  | 0.026     | 0.048      | 79             |
| NL Manistique River 770073              | 0.005                            | 0.014     | <b>0.018</b>  | 0.021     | 0.043      | 92             |
| NL Thunder Bay River 040123             | 0.006                            | 0.013     | <b>0.016</b>  | 0.020     | 0.030      | 72             |
| NC Boardman River 280014                | ND                               | 0.008     | <b>0.010</b>  | 0.014     | 0.098      | 75             |
| NL Au Sable River 350061                | ND                               | 0.007     | <b>0.010</b>  | 0.012     | 0.040      | 160            |
| NL Cheboygan River 160073               | ND                               | 0.005     | <b>0.008</b>  | 0.011     | 0.020      | 73             |

| <i>Minimally Impacted Sites</i>              | <b>**Total Phosphorus (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|----------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 0.021                            | 0.031            | <b>0.053</b>         | 0.074            | 0.094             | 8                     |
| HE Black River (Headwaters) 760058           | 0.033                            | 0.041            | <b>0.051</b>         | 0.059            | 0.071             | 8                     |
| SM Pokagon Creek 140110                      | 0.024                            | 0.039            | <b>0.048</b>         | 0.069            | 0.141             | 8                     |
| SM Grand River (Headwaters) 380083           | 0.010                            | 0.020            | <b>0.045</b>         | 0.053            | 0.060             | 12                    |
| SM Bellamy Creek 340186                      | 0.014                            | 0.021            | <b>0.040</b>         | 0.051            | 0.062             | 8                     |
| NL Bear Creek 170154                         | 0.015                            | 0.019            | <b>0.033</b>         | 0.056            | 0.073             | 8                     |
| SM Coldwater River 120215                    | 0.010                            | 0.018            | <b>0.028</b>         | 0.033            | 0.043             | 8                     |
| SM Huron River (Headwaters) 470521           | 0.014                            | 0.024            | <b>0.028</b>         | 0.034            | 0.038             | 12                    |
| SM South Branch Kalamazoo River 130331       | 0.013                            | 0.017            | <b>0.028</b>         | 0.033            | 0.037             | 8                     |
| HE Evergreen Creek 790157                    | 0.011                            | 0.019            | <b>0.026</b>         | 0.033            | 0.080             | 12                    |
| SM South Branch Flint River 440173           | 0.009                            | 0.016            | <b>0.026</b>         | 0.033            | 0.050             | 12                    |
| NL Fox River 770082                          | 0.018                            | 0.020            | <b>0.024</b>         | 0.026            | 0.030             | 8                     |
| NL Bigelow Creek 630291                      | 0.013                            | 0.016            | <b>0.023</b>         | 0.034            | 0.070             | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 0.012                            | 0.016            | <b>0.023</b>         | 0.027            | 0.041             | 8                     |
| SM North Branch Clinton River 500467         | 0.010                            | 0.014            | <b>0.021</b>         | 0.030            | 0.038             | 8                     |
| SM River Raisin (Headwaters) 380393          | 0.011                            | 0.015            | <b>0.019</b>         | 0.026            | 0.034             | 12                    |
| NL Eighteen Mile Creek 210217                | 0.008                            | 0.012            | <b>0.018</b>         | 0.026            | 0.069             | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | 0.012                            | 0.015            | <b>0.016</b>         | 0.020            | 0.029             | 8                     |
| NL Pigeon River 160177                       | NQ                               | 0.008            | <b>0.015</b>         | 0.018            | 0.026             | 8                     |
| NL East Branch Ontonagon 310468              | 0.006                            | 0.011            | <b>0.015</b>         | 0.021            | 0.066             | 8                     |
| NL Bryan Creek 520258                        | 0.008                            | 0.009            | <b>0.015</b>         | 0.025            | 0.033             | 8                     |
| NL Anderson Creek 830159                     | 0.006                            | 0.008            | <b>0.014</b>         | 0.015            | 0.022             | 7                     |
| SM Shiawassee River (Headwaters) 631036      | 0.010                            | 0.012            | <b>0.014</b>         | 0.018            | 0.039             | 8                     |
| NL Paint River 360124                        | 0.005                            | 0.006            | <b>0.013</b>         | 0.017            | 0.020             | 12                    |
| NL West Branch Tittabawassee 260068          | 0.006                            | 0.009            | <b>0.012</b>         | 0.017            | 0.061             | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | 0.007                            | 0.009            | <b>0.011</b>         | 0.013            | 0.021             | 8                     |
| NL Perry Creek 680056                        | NQ                               | 0.008            | <b>0.010</b>         | 0.015            | 0.019             | 12                    |
| NL East Creek 280318                         | 0.006                            | 0.007            | <b>0.010</b>         | 0.013            | 0.041             | 12                    |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Ortho Phosphate (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>                | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Clinton River 500233                      | 0.015             | 0.053                           | <b>0.069</b>         | 0.095            | 0.240             | 160                   |
| HE Flint River 730285                        | NQ                | 0.030                           | <b>0.051</b>         | 0.070            | 0.270             | 78                    |
| SM Grand River (Upper) 340025                | 0.005             | 0.022                           | <b>0.040</b>         | 0.059            | 0.129             | 79                    |
| HE Saginaw River 090177                      | NQ                | 0.022                           | <b>0.031</b>         | 0.041            | 0.070             | 156                   |
| HE River Rouge 820070                        | 0.005             | 0.021                           | <b>0.028</b>         | 0.045            | 0.090             | 73                    |
| SM Grand River (Lower) 700123                | ND                | 0.012                           | <b>0.026</b>         | 0.044            | 0.109             | 173                   |
| HE River Raisin 580046                       | 0.005             | 0.009                           | <b>0.019</b>         | 0.042            | 0.127             | 78                    |
| HE Shiawassee River 730023                   | ND                | 0.008                           | <b>0.018</b>         | 0.028            | 0.077             | 74                    |
| NL Pine River 490006                         | ND                | 0.010                           | <b>0.018</b>         | 0.026            | 0.071             | 71                    |
| HE Tittabawassee River 730025                | 0.006             | 0.012                           | <b>0.017</b>         | 0.023            | 0.047             | 79                    |
| HE Cass River 730024                         | NQ                | 0.009                           | <b>0.014</b>         | 0.028            | 0.089             | 79                    |
| SM Kalamazoo River (Upper) 390598            | NQ                | 0.010                           | <b>0.014</b>         | 0.024            | 0.042             | 78                    |
| NL Ontonagon River 660038                    | ND                | 0.008                           | <b>0.013</b>         | 0.024            | 0.378             | 71                    |
| SM St. Joseph River (Lower) 110628           | ND                | 0.007                           | <b>0.013</b>         | 0.024            | 0.124             | 92                    |
| SM Kalamazoo River (Lower) 030077            | ND                | 0.007                           | <b>0.012</b>         | 0.024            | 0.118             | 174                   |
| HE Huron River 580364                        | ND                | 0.006                           | <b>0.010</b>         | 0.015            | 0.030             | 79                    |
| NL Escanaba River 210102                     | ND                | 0.005                           | <b>0.010</b>         | 0.015            | 0.151             | 91                    |
| SM Pere Marquette River 530027               | NQ                | 0.007                           | <b>0.010</b>         | 0.013            | 0.048             | 91                    |
| HE Black River 740267                        | ND                | 0.005                           | <b>0.010</b>         | 0.016            | 0.126             | 48                    |
| SM Muskegon River (Lower) 610273             | ND                | 0.005                           | <b>0.007</b>         | 0.010            | 0.042             | 173                   |
| NL Muskegon River (Upper) 670008             | ND                | 0.005                           | <b>0.007</b>         | 0.011            | 0.022             | 80                    |
| NL Menominee River 550038                    | ND                | 0.005                           | <b>0.006</b>         | 0.009            | 0.016             | 87                    |
| SM St. Joseph River (Upper) 750273           | ND                | 0.005                           | <b>0.006</b>         | 0.008            | 0.169             | 74                    |
| NC Boardman River 280014                     | ND                | 0.001                           | <b>0.005</b>         | 0.005            | 0.012             | 75                    |
| NC Manistee River 510088                     | ND                | 0.005                           | <b>0.005</b>         | 0.007            | 0.013             | 71                    |
| NL Au Sable River 350061                     | ND                | 0.005                           | <b>0.005</b>         | 0.005            | 0.025             | 160                   |
| NL Cheboygan River 160073                    | ND                | 0.001                           | <b>0.005</b>         | 0.005            | 0.010             | 73                    |
| NL Manistique River 770073                   | ND                | 0.005                           | <b>0.005</b>         | 0.005            | 0.017             | 91                    |
| NL Sturgeon River 210032                     | ND                | 0.005                           | <b>0.005</b>         | 0.005            | 0.012             | 79                    |
| NL Tahquamenon River 170141                  | ND                | 0.005                           | <b>0.005</b>         | 0.006            | 0.020             | 84                    |
| NL Thunder Bay River 040123                  | ND                | 0.005                           | <b>0.005</b>         | 0.006            | 4.000             | 73                    |

| <i>Minimally Impacted Sites</i>              |                   |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b>**Ortho Phosphate (mg/L)</b>              |                   |                  |                      |                  |                   |                       |
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM Bellamy Creek 340186                      | NQ                | 0.007            | <b>0.020</b>         | 0.029            | 0.043             | 8                     |
| HE Black River (Headwaters) 760058           | 0.006             | 0.010            | <b>0.013</b>         | 0.016            | 0.018             | 8                     |
| HE Johnson Drain 821417                      | 0.005             | 0.009            | <b>0.013</b>         | 0.027            | 0.039             | 8                     |
| SM Pokagon Creek 140110                      | 0.006             | 0.010            | <b>0.012</b>         | 0.018            | 0.022             | 8                     |
| SM North Branch Clinton River 500467         | NQ                | 0.006            | <b>0.010</b>         | 0.012            | 0.016             | 8                     |
| NL Bear Creek 170154                         | NQ                | 0.005            | <b>0.008</b>         | 0.012            | 0.020             | 8                     |
| NL Fox River 770082                          | NQ                | 0.006            | <b>0.008</b>         | 0.009            | 0.009             | 8                     |
| NL East Branch Ontonagon 310468              | 0.005             | 0.005            | <b>0.007</b>         | 0.008            | 0.020             | 7                     |
| SM Huron River (Headwaters) 470521           | NQ                | 0.005            | <b>0.006</b>         | 0.009            | 0.010             | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | ND                | 0.005            | <b>0.006</b>         | 0.007            | 0.008             | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | NQ                | 0.005            | <b>0.006</b>         | 0.007            | 0.007             | 8                     |
| HE Evergreen Creek 790157                    | NQ                | 0.005            | <b>0.006</b>         | 0.010            | 0.017             | 12                    |
| SM Coldwater River 120215                    | NQ                | 0.004            | <b>0.005</b>         | 0.008            | 0.009             | 8                     |
| SM Grand River (Headwaters) 380083           | ND                | 0.004            | <b>0.005</b>         | 0.009            | 0.013             | 12                    |
| NL Anderson Creek 830159                     | ND                | 0.005            | <b>0.005</b>         | 0.005            | 0.005             | 8                     |
| NL Bigelow Creek 630291                      | ND                | 0.005            | <b>0.005</b>         | 0.007            | 0.011             | 12                    |
| NL Bryan Creek 520258                        | ND                | 0.001            | <b>0.005</b>         | 0.005            | 0.006             | 8                     |
| NL Eighteen Mile Creek 210217                | NQ                | 0.005            | <b>0.005</b>         | 0.005            | 0.005             | 7                     |
| NL Paint River 360124                        | ND                | 0.005            | <b>0.005</b>         | 0.006            | 0.011             | 12                    |
| NL Perry Creek 680056                        | ND                | 0.003            | <b>0.005</b>         | 0.005            | 0.005             | 12                    |
| SM River Raisin (Headwaters) 380393          | ND                | 0.005            | <b>0.005</b>         | 0.005            | 0.005             | 12                    |
| SM South Branch Kalamazoo River 130331       | NQ                | 0.005            | <b>0.005</b>         | 0.007            | 0.008             | 8                     |
| NL West Branch Tittabawassee 260068          | ND                | 0.005            | <b>0.005</b>         | 0.005            | 0.008             | 12                    |
| NL East Creek 280318                         | ND                | 0.002            | <b>0.004</b>         | 0.004            | 0.006             | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | ND                | 0.001            | <b>0.004</b>         | 0.004            | 0.005             | 8                     |
| SM South Branch Flint River 440173           | ND                | 0.004            | <b>0.004</b>         | 0.009            | 0.020             | 12                    |
| NL Pigeon River 160177                       | ND                | 0.001            | <b>0.002</b>         | 0.004            | 0.005             | 8                     |
| SM Shiawassee River (Headwaters) 631036      | ND                | 0.001            | <b>0.002</b>         | 0.004            | 0.006             | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Total Kjeldahl Nitrogen (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-----------------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                       | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Saginaw River 090177                      | 0.62                                    | 0.92             | <b>1.07</b>          | 1.21             | 2.34              | 155                   |
| SM Grand River (Lower) 700123                | 0.49                                    | 0.87             | <b>1.00</b>          | 1.22             | 2.70              | 174                   |
| HE Clinton River 500233                      | 0.64                                    | 0.83             | <b>0.98</b>          | 1.14             | 3.10              | 161                   |
| HE Flint River 730285                        | 0.63                                    | 0.90             | <b>0.98</b>          | 1.13             | 4.50              | 78                    |
| SM Grand River (Upper) 340025                | 0.50                                    | 0.81             | <b>0.94</b>          | 1.08             | 1.58              | 79                    |
| HE Cass River 730024                         | 0.39                                    | 0.72             | <b>0.86</b>          | 1.04             | 1.70              | 79                    |
| SM Kalamazoo River (Lower) 030077            | 0.38                                    | 0.65             | <b>0.80</b>          | 0.93             | 1.36              | 174                   |
| HE Black River 740267                        | 0.31                                    | 0.55             | <b>0.77</b>          | 1.07             | 2.50              | 48                    |
| HE Huron River 580364                        | 0.51                                    | 0.67             | <b>0.72</b>          | 0.81             | 1.02              | 78                    |
| HE Tittabawassee River 730025                | 0.42                                    | 0.65             | <b>0.72</b>          | 0.80             | 1.10              | 79                    |
| HE River Raisin 580046                       | 0.40                                    | 0.60             | <b>0.69</b>          | 0.89             | 2.49              | 78                    |
| HE Shiawassee River 730023                   | 0.46                                    | 0.60             | <b>0.67</b>          | 0.84             | 1.68              | 74                    |
| HE River Rouge 820070                        | 0.17                                    | 0.48             | <b>0.65</b>          | 0.90             | 4.70              | 74                    |
| NL Escanaba River 210102                     | 0.41                                    | 0.55             | <b>0.63</b>          | 0.73             | 1.06              | 90                    |
| SM Kalamazoo River (Upper) 390598            | 0.34                                    | 0.51             | <b>0.62</b>          | 0.83             | 1.24              | 79                    |
| SM St. Joseph River (Lower) 110628           | 0.30                                    | 0.50             | <b>0.61</b>          | 0.76             | 1.67              | 91                    |
| NL Tahquamenon River 170141                  | 0.23                                    | 0.44             | <b>0.57</b>          | 0.71             | 1.08              | 84                    |
| NL Pine River 490006                         | 0.24                                    | 0.36             | <b>0.55</b>          | 0.73             | 1.25              | 71                    |
| SM St. Joseph River (Upper) 750273           | 0.37                                    | 0.47             | <b>0.54</b>          | 0.63             | 0.94              | 74                    |
| NL Sturgeon River 210032                     | 0.23                                    | 0.37             | <b>0.53</b>          | 0.68             | 1.16              | 79                    |
| NL Menominee River 550038                    | 0.27                                    | 0.37             | <b>0.48</b>          | 0.60             | 0.97              | 87                    |
| NL Manistique River 770073                   | 0.24                                    | 0.34             | <b>0.43</b>          | 0.56             | 0.99              | 92                    |
| NL Muskegon River (Upper) 670008             | 0.19                                    | 0.34             | <b>0.43</b>          | 0.59             | 1.18              | 80                    |
| NL Thunder Bay River 040123                  | 0.25                                    | 0.35             | <b>0.41</b>          | 0.49             | 0.84              | 72                    |
| SM Muskegon River (Lower) 610273             | ND                                      | 0.36             | <b>0.41</b>          | 0.47             | 0.97              | 173                   |
| NL Ontonagon River 660038                    | 0.22                                    | 0.30             | <b>0.41</b>          | 0.56             | 2.00              | 71                    |
| SM Pere Marquette River 530027               | 0.12                                    | 0.28             | <b>0.36</b>          | 0.47             | 0.81              | 89                    |
| NL Cheboygan River 160073                    | 0.19                                    | 0.25             | <b>0.28</b>          | 0.29             | 0.37              | 73                    |
| NC Manistee River 510088                     | 0.16                                    | 0.19             | <b>0.23</b>          | 0.30             | 0.80              | 71                    |
| NL Au Sable River 350061                     | ND                                      | 0.15             | <b>0.19</b>          | 0.23             | 0.71              | 160                   |
| NC Boardman River 280014                     | NQ                                      | 0.15             | <b>0.18</b>          | 0.27             | 1.07              | 75                    |

| <i>Minimally Impacted Sites</i>              | <b>**Total Kjeldahl Nitrogen (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-----------------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                       | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Black River (Headwaters) 760058           | 0.47                                    | 0.65             | <b>0.81</b>          | 0.91             | 0.97              | 8                     |
| SM Grand River (Headwaters) 380083           | 0.36                                    | 0.47             | <b>0.71</b>          | 0.87             | 0.97              | 12                    |
| HE Johnson Drain 821417                      | 0.28                                    | 0.49             | <b>0.71</b>          | 1.02             | 1.20              | 8                     |
| SM Huron River (Headwaters) 470521           | 0.53                                    | 0.60             | <b>0.68</b>          | 0.73             | 0.80              | 12                    |
| SM Pokagon Creek 140110                      | 0.38                                    | 0.47             | <b>0.60</b>          | 0.71             | 1.28              | 8                     |
| SM Coldwater River 120215                    | 0.43                                    | 0.50             | <b>0.53</b>          | 0.57             | 0.66              | 8                     |
| NL Bear Creek 170154                         | 0.25                                    | 0.43             | <b>0.51</b>          | 0.78             | 1.17              | 8                     |
| SM Bellamy Creek 340186                      | 0.25                                    | 0.36             | <b>0.49</b>          | 0.63             | 1.05              | 8                     |
| SM River Raisin (Headwaters) 380393          | 0.39                                    | 0.46             | <b>0.49</b>          | 0.60             | 0.66              | 12                    |
| SM South Branch Kalamazoo River 130331       | 0.21                                    | 0.44             | <b>0.48</b>          | 0.56             | 0.65              | 8                     |
| SM South Branch Flint River 440173           | 0.26                                    | 0.37             | <b>0.47</b>          | 0.57             | 0.62              | 12                    |
| HE Evergreen Creek 790157                    | 0.25                                    | 0.40             | <b>0.44</b>          | 0.48             | 0.72              | 12                    |
| NL Bryan Creek 520258                        | 0.21                                    | 0.27             | <b>0.40</b>          | 0.55             | 1.00              | 8                     |
| NL Eighteen Mile Creek 210217                | 0.20                                    | 0.24             | <b>0.38</b>          | 0.54             | 0.77              | 8                     |
| NL Anderson Creek 830159                     | 0.21                                    | 0.26             | <b>0.37</b>          | 0.39             | 0.48              | 7                     |
| SM Shiawassee River (Headwaters) 631036      | 0.29                                    | 0.33             | <b>0.36</b>          | 0.38             | 0.65              | 8                     |
| SM North Branch Clinton River 500467         | 0.18                                    | 0.25             | <b>0.29</b>          | 0.43             | 0.70              | 8                     |
| NL Pigeon River 160177                       | 0.12                                    | 0.23             | <b>0.28</b>          | 0.34             | 0.49              | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 0.17                                    | 0.24             | <b>0.28</b>          | 0.31             | 0.41              | 8                     |
| NL Bigelow Creek 630291                      | 0.17                                    | 0.24             | <b>0.27</b>          | 0.37             | 0.91              | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 0.11                                    | 0.21             | <b>0.27</b>          | 0.32             | 0.38              | 8                     |
| NL East Creek 280318                         | 0.11                                    | 0.19             | <b>0.26</b>          | 0.29             | 0.82              | 12                    |
| NL Paint River 360124                        | 0.19                                    | 0.22             | <b>0.26</b>          | 0.39             | 0.49              | 12                    |
| NL Perry Creek 680056                        | 0.16                                    | 0.19             | <b>0.24</b>          | 0.33             | 0.36              | 12                    |
| NL East Branch Ontonagon 310468              | 0.14                                    | 0.18             | <b>0.24</b>          | 0.34             | 0.59              | 8                     |
| NL Fox River 770082                          | 0.14                                    | 0.19             | <b>0.21</b>          | 0.25             | 0.29              | 8                     |
| NL West Branch Tittabawassee 260068          | NQ                                      | 0.14             | <b>0.21</b>          | 0.34             | 0.72              | 12                    |
| NL Tahquamenon River (Headwaters) 480033     | NQ                                      | 0.09             | <b>0.14</b>          | 0.16             | 0.22              | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Total Nitrate (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|-------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>              | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Flint River 730285                        | 0.62              | 1.52                          | <b>2.12</b>          | 3.10             | 5.80              | 78                    |
| HE Cass River 730024                         | ND                | 0.76                          | <b>1.86</b>          | 3.60             | 7.10              | 79                    |
| SM Grand River (Upper) 340025                | 0.06              | 1.31                          | <b>1.78</b>          | 3.00             | 6.40              | 79                    |
| HE Clinton River 500233                      | 0.58              | 1.16                          | <b>1.57</b>          | 2.10             | 4.70              | 161                   |
| SM St. Joseph River (Lower) 110628           | 0.68              | 1.23                          | <b>1.49</b>          | 1.82             | 4.30              | 91                    |
| SM Grand River (Lower) 700123                | 0.21              | 1.05                          | <b>1.49</b>          | 2.15             | 5.16              | 174                   |
| HE Saginaw River 090177                      | 0.19              | 0.98                          | <b>1.39</b>          | 2.50             | 4.88              | 155                   |
| HE River Raisin 580046                       | ND                | 0.44                          | <b>1.36</b>          | 2.95             | 10.90             | 78                    |
| SM St. Joseph River (Upper) 750273           | 0.73              | 1.06                          | <b>1.32</b>          | 1.56             | 2.10              | 73                    |
| SM Kalamazoo River (Lower) 030077            | 0.30              | 0.78                          | <b>1.03</b>          | 1.40             | 2.86              | 174                   |
| SM Kalamazoo River (Upper) 390598            | 0.55              | 0.87                          | <b>0.99</b>          | 1.12             | 2.38              | 79                    |
| HE River Rouge 820070                        | 0.39              | 0.66                          | <b>0.78</b>          | 0.98             | 1.61              | 73                    |
| HE Shiawassee River 730023                   | 0.18              | 0.52                          | <b>0.75</b>          | 1.40             | 4.40              | 74                    |
| HE Tittabawassee River 730025                | 0.24              | 0.49                          | <b>0.74</b>          | 1.07             | 3.20              | 79                    |
| HE Black River 740267                        | ND                | 0.02                          | <b>0.38</b>          | 2.95             | 9.90              | 48                    |
| SM Muskegon River (Lower) 610273             | 0.04              | 0.23                          | <b>0.30</b>          | 0.38             | 0.71              | 173                   |
| HE Huron River 580364                        | ND                | 0.13                          | <b>0.28</b>          | 0.57             | 1.48              | 79                    |
| NC Boardman River 280014                     | 0.13              | 0.17                          | <b>0.20</b>          | 0.23             | 0.41              | 75                    |
| NL Muskegon River (Upper) 670008             | 0.03              | 0.16                          | <b>0.20</b>          | 0.25             | 1.61              | 80                    |
| NC Manistee River 510088                     | 0.06              | 0.13                          | <b>0.15</b>          | 0.18             | 0.30              | 71                    |
| NL Escanaba River 210102                     | ND                | 0.08                          | <b>0.11</b>          | 0.16             | 0.49              | 90                    |
| SM Pere Marquette River 530027               | 0.04              | 0.08                          | <b>0.11</b>          | 0.15             | 0.52              | 91                    |
| NL Tahquamenon River 170141                  | ND                | 0.04                          | <b>0.07</b>          | 0.09             | 0.12              | 84                    |
| NL Sturgeon River 210032                     | ND                | 0.04                          | <b>0.06</b>          | 0.09             | 0.36              | 79                    |
| NL Menominee River 550038                    | ND                | 0.01                          | <b>0.05</b>          | 0.10             | 0.27              | 85                    |
| NL Manistique River 770073                   | ND                | 0.04                          | <b>0.05</b>          | 0.06             | 0.30              | 92                    |
| NL Cheboygan River 160073                    | ND                | 0.01                          | <b>0.02</b>          | 0.04             | 0.14              | 72                    |
| NL Pine River 490006                         | ND                | 0.01                          | <b>0.02</b>          | 0.04             | 0.16              | 70                    |
| NL Thunder Bay River 040123                  | ND                | 0.01                          | <b>0.02</b>          | 0.03             | 0.29              | 72                    |
| NL Au Sable River 350061                     | ND                | 0.01                          | <b>0.01</b>          | 0.05             | 0.16              | 158                   |
| NL Ontonagon River 660038                    | ND                | 0.00                          | <b>0.01</b>          | 0.03             | 0.21              | 67                    |

| <i>Minimally Impacted Sites</i>              | <b>**Total Nitrate (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>             | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM Bellamy Creek 340186                      | 1.48                          | 1.97             | <b>2.65</b>          | 3.35             | 7.38              | 8                     |
| SM Pokagon Creek 140110                      | 1.91                          | 2.20             | <b>2.40</b>          | 2.55             | 3.40              | 8                     |
| SM South Branch Kalamazoo River 130331       | 1.54                          | 1.83             | <b>2.05</b>          | 2.15             | 2.69              | 8                     |
| HE Johnson Drain 821417                      | 0.09                          | 0.32             | <b>0.93</b>          | 2.65             | 2.96              | 8                     |
| SM Coldwater River 120215                    | 0.43                          | 0.49             | <b>0.84</b>          | 1.23             | 1.67              | 8                     |
| NL East Creek 280318                         | 0.25                          | 0.45             | <b>0.77</b>          | 0.92             | 0.97              | 12                    |
| NL Anderson Creek 830159                     | 0.30                          | 0.61             | <b>0.76</b>          | 1.29             | 1.56              | 8                     |
| SM North Branch Clinton River 500467         | 0.29                          | 0.54             | <b>0.76</b>          | 1.19             | 1.49              | 8                     |
| SM Grand River (Headwaters) 380083           | 0.11                          | 0.25             | <b>0.37</b>          | 0.46             | 0.82              | 12                    |
| HE Black River (Headwaters) 760058           | ND                            | 0.17             | <b>0.36</b>          | 2.54             | 3.80              | 8                     |
| HE Evergreen Creek 790157                    | 0.05                          | 0.13             | <b>0.35</b>          | 0.71             | 1.40              | 12                    |
| NL Perry Creek 680056                        | 0.07                          | 0.15             | <b>0.23</b>          | 0.28             | 0.35              | 12                    |
| SM Huron River (Headwaters) 470521           | 0.08                          | 0.16             | <b>0.19</b>          | 0.25             | 0.38              | 12                    |
| NL Bigelow Creek 630291                      | 0.08                          | 0.09             | <b>0.12</b>          | 0.19             | 0.28              | 12                    |
| SM River Raisin (Headwaters) 380393          | 0.02                          | 0.07             | <b>0.11</b>          | 0.17             | 0.31              | 12                    |
| NL Fox River 770082                          | 0.07                          | 0.07             | <b>0.08</b>          | 0.10             | 0.11              | 8                     |
| SM South Branch Flint River 440173           | 0.02                          | 0.04             | <b>0.08</b>          | 0.12             | 0.16              | 12                    |
| NL East Branch Ontonagon 310468              | 0.02                          | 0.04             | <b>0.07</b>          | 0.08             | 0.15              | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | 0.04                          | 0.05             | <b>0.06</b>          | 0.08             | 0.12              | 8                     |
| NL Paint River 360124                        | ND                            | 0.02             | <b>0.06</b>          | 0.09             | 0.14              | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 0.02                          | 0.02             | <b>0.05</b>          | 0.06             | 0.07              | 8                     |
| NL Pigeon River 160177                       | 0.02                          | 0.03             | <b>0.04</b>          | 0.06             | 0.09              | 8                     |
| NL Bryan Creek 520258                        | NQ                            | 0.01             | <b>0.03</b>          | 0.04             | 0.39              | 8                     |
| SM Shiawassee River (Headwaters) 631036      | NQ                            | 0.02             | <b>0.03</b>          | 0.07             | 0.09              | 8                     |
| NL West Branch Tittabawassee 260068          | ND                            | 0.01             | <b>0.02</b>          | 0.08             | 0.18              | 12                    |
| NL Bear Creek 170154                         | ND                            | 0.01             | <b>0.01</b>          | 0.02             | 0.06              | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | NQ                            | 0.01             | <b>0.01</b>          | 0.01             | 0.03              | 8                     |
| NL Eighteen Mile Creek 210217                | ND                            | 0.00             | <b>0.01</b>          | 0.02             | 0.07              | 8                     |



| <i>Intensive &amp; Integrator Sites</i> |            | <b>**Total Nitrite (mg/L)</b> |               |           |            |                |
|-----------------------------------------|------------|-------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>   | <u>Min</u> | <u>Q1</u>                     | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| HE Clinton River 500233                 | NQ         | 0.022                         | <b>0.033</b>  | 0.048     | 0.106      | 161            |
| HE Saginaw River 090177                 | 0.012      | 0.024                         | <b>0.031</b>  | 0.044     | 0.113      | 156            |
| SM Grand River (Lower) 700123           | 0.013      | 0.023                         | <b>0.029</b>  | 0.038     | 0.102      | 174            |
| HE River Rouge 820070                   | NQ         | 0.016                         | <b>0.024</b>  | 0.032     | 0.061      | 73             |
| HE Flint River 730285                   | NQ         | 0.013                         | <b>0.021</b>  | 0.032     | 0.101      | 78             |
| SM Grand River (Upper) 340025           | NQ         | 0.012                         | <b>0.020</b>  | 0.031     | 0.108      | 79             |
| SM Kalamazoo River (Lower) 030077       | NQ         | 0.015                         | <b>0.019</b>  | 0.027     | 0.087      | 174            |
| HE Cass River 730024                    | ND         | 0.011                         | <b>0.018</b>  | 0.024     | 0.098      | 79             |
| HE Tittabawassee River 730025           | NQ         | 0.012                         | <b>0.016</b>  | 0.022     | 0.041      | 79             |
| SM St. Joseph River (Upper) 750273      | NQ         | 0.012                         | <b>0.015</b>  | 0.020     | 0.033      | 74             |
| HE River Raisin 580046                  | ND         | 0.010                         | <b>0.014</b>  | 0.024     | 0.087      | 78             |
| HE Black River 740267                   | ND         | 0.006                         | <b>0.013</b>  | 0.024     | 0.247      | 47             |
| SM St. Joseph River (Lower) 110628      | ND         | 0.010                         | <b>0.013</b>  | 0.016     | 0.039      | 92             |
| NL Escanaba River 210102                | NQ         | 0.010                         | <b>0.012</b>  | 0.019     | 0.058      | 91             |
| HE Huron River 580364                   | NQ         | 0.010                         | <b>0.011</b>  | 0.015     | 0.037      | 79             |
| SM Kalamazoo River (Upper) 390598       | NQ         | 0.010                         | <b>0.011</b>  | 0.016     | 0.070      | 79             |
| HE Shiawassee River 730023              | ND         | 0.010                         | <b>0.010</b>  | 0.015     | 0.090      | 74             |
| NL Manistique River 770073              | NQ         | 0.010                         | <b>0.010</b>  | 0.010     | 0.010      | 92             |
| NL Menominee River 550038               | ND         | 0.010                         | <b>0.010</b>  | 0.010     | 0.016      | 87             |
| NL Ontonagon River 660038               | ND         | 0.010                         | <b>0.010</b>  | 0.013     | 0.162      | 71             |
| NL Pine River 490006                    | ND         | 0.010                         | <b>0.010</b>  | 0.011     | 0.031      | 71             |
| NL Tahquamenon River 170141             | ND         | 0.010                         | <b>0.010</b>  | 0.010     | 0.011      | 84             |
| SM Muskegon River (Lower) 610273        | NQ         | 0.010                         | <b>0.010</b>  | 0.010     | 0.022      | 173            |
| NL Muskegon River (Upper) 670008        | ND         | 0.010                         | <b>0.010</b>  | 0.010     | 0.012      | 80             |
| SM Pere Marquette River 530027          | ND         | 0.010                         | <b>0.010</b>  | 0.010     | 0.021      | 91             |
| NC Boardman River 280014                | ND         | 0.006                         | <b>0.006</b>  | 0.006     | 0.010      | 75             |
| NC Manistee River 510088                | ND         | 0.006                         | <b>0.006</b>  | 0.006     | 0.010      | 71             |
| NL Au Sable River 350061                | ND         | 0.001                         | <b>0.006</b>  | 0.006     | 0.010      | 160            |
| NL Cheboygan River 160073               | ND         | 0.006                         | <b>0.006</b>  | 0.006     | 0.010      | 73             |
| NL Sturgeon River 210032                | ND         | 0.006                         | <b>0.006</b>  | 0.006     | 0.010      | 79             |
| NL Thunder Bay River 040123             | ND         | 0.006                         | <b>0.006</b>  | 0.006     | 0.010      | 73             |

| <i>Minimally Impacted Sites</i>              |                   |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b>**Total Nitrite (mg/L)</b>                |                   |                  |                      |                  |                   |                       |
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | NQ                | 0.011            | <b>0.020</b>         | 0.034            | 0.101             | 8                     |
| SM Bellamy Creek 340186                      | NQ                | 0.010            | <b>0.011</b>         | 0.014            | 0.027             | 8                     |
| SM Pokagon Creek 140110                      | NQ                | 0.010            | <b>0.011</b>         | 0.013            | 0.014             | 8                     |
| SM South Branch Kalamazoo River 130331       | NQ                | 0.010            | <b>0.010</b>         | 0.012            | 0.015             | 8                     |
| HE Black River (Headwaters) 760058           | NQ                | 0.006            | <b>0.009</b>         | 0.015            | 0.022             | 8                     |
| HE Evergreen Creek 790157                    | NQ                | 0.006            | <b>0.009</b>         | 0.016            | 0.020             | 12                    |
| NL East Creek 280318                         | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| NL Anderson Creek 830159                     | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Bear Creek 170154                         | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.011             | 8                     |
| NL Bigelow Creek 630291                      | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| NL Bryan Creek 520258                        | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL East Branch Ontonagon 310468              | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Eighteen Mile Creek 210217                | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 7                     |
| NL Fox River 770082                          | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Paint River 360124                        | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Perry Creek 680056                        | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| NL Pigeon River 160177                       | ND                | 0.001            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | ND                | 0.001            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | ND                | 0.001            | <b>0.006</b>         | 0.006            | 0.010             | 7                     |
| SM Coldwater River 120215                    | NQ                | 0.006            | <b>0.006</b>         | 0.014            | 0.023             | 8                     |
| SM Grand River (Headwaters) 380083           | NQ                | 0.006            | <b>0.006</b>         | 0.009            | 0.015             | 12                    |
| SM Huron River (Headwaters) 470521           | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.016             | 12                    |
| SM North Branch Clinton River 500467         | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| SM River Raisin (Headwaters) 380393          | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| SM Shiawassee River (Headwaters) 631036      | NQ                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| SM South Branch Flint River 440173           | ND                | 0.001            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |
| NL West Branch Tittabawassee 260068          | ND                | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 12                    |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Total Ammonia (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>             | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE River Rouge 820070                        | 0.020                         | 0.117            | <b>0.153</b>         | 0.240            | 3.300             | 73                    |
| HE Saginaw River 090177                      | ND                            | 0.100            | <b>0.131</b>         | 0.186            | 0.741             | 154                   |
| HE Clinton River 500233                      | ND                            | 0.060            | <b>0.090</b>         | 0.126            | 0.760             | 161                   |
| SM Grand River (Lower) 700123                | ND                            | 0.015            | <b>0.063</b>         | 0.133            | 0.810             | 174                   |
| NL Escanaba River 210102                     | 0.015                         | 0.043            | <b>0.059</b>         | 0.081            | 0.194             | 90                    |
| HE Huron River 580364                        | NQ                            | 0.034            | <b>0.056</b>         | 0.077            | 0.186             | 78                    |
| HE Tittabawassee River 730025                | NQ                            | 0.025            | <b>0.048</b>         | 0.078            | 0.280             | 78                    |
| SM St. Joseph River (Upper) 750273           | ND                            | 0.026            | <b>0.044</b>         | 0.061            | 0.151             | 74                    |
| SM Kalamazoo River (Upper) 390598            | NQ                            | 0.022            | <b>0.038</b>         | 0.056            | 0.150             | 78                    |
| HE Flint River 730285                        | ND                            | 0.022            | <b>0.038</b>         | 0.065            | 0.930             | 78                    |
| SM Kalamazoo River (Lower) 030077            | ND                            | 0.018            | <b>0.036</b>         | 0.066            | 0.300             | 174                   |
| SM Grand River (Upper) 340025                | ND                            | 0.013            | <b>0.029</b>         | 0.057            | 0.280             | 78                    |
| HE Shiawassee River 730023                   | ND                            | 0.017            | <b>0.028</b>         | 0.045            | 0.250             | 74                    |
| SM Muskegon River (Lower) 610273             | ND                            | 0.013            | <b>0.021</b>         | 0.031            | 0.099             | 173                   |
| HE Cass River 730024                         | ND                            | 0.010            | <b>0.020</b>         | 0.050            | 0.500             | 79                    |
| HE River Raisin 580046                       | ND                            | 0.006            | <b>0.019</b>         | 0.050            | 0.170             | 78                    |
| NC Manistee River 510088                     | NQ                            | 0.011            | <b>0.018</b>         | 0.024            | 0.047             | 71                    |
| NL Thunder Bay River 040123                  | ND                            | 0.013            | <b>0.018</b>         | 0.025            | 0.054             | 72                    |
| SM Pere Marquette River 530027               | NQ                            | 0.015            | <b>0.018</b>         | 0.025            | 0.068             | 90                    |
| NL Sturgeon River 210032                     | NQ                            | 0.013            | <b>0.017</b>         | 0.024            | 0.062             | 79                    |
| NL Manistique River 770073                   | NQ                            | 0.012            | <b>0.017</b>         | 0.021            | 0.053             | 92                    |
| NL Pine River 490006                         | ND                            | 0.012            | <b>0.016</b>         | 0.022            | 0.110             | 71                    |
| NL Au Sable River 350061                     | ND                            | 0.010            | <b>0.015</b>         | 0.020            | 0.047             | 159                   |
| NL Cheboygan River 160073                    | NQ                            | 0.013            | <b>0.015</b>         | 0.019            | 0.035             | 73                    |
| NL Tahquamenon River 170141                  | NQ                            | 0.011            | <b>0.015</b>         | 0.026            | 0.047             | 84                    |
| SM St. Joseph River (Lower) 110628           | ND                            | 0.010            | <b>0.015</b>         | 0.028            | 0.310             | 91                    |
| NL Muskegon River (Upper) 670008             | ND                            | 0.010            | <b>0.014</b>         | 0.021            | 0.089             | 80                    |
| NL Menominee River 550038                    | ND                            | 0.010            | <b>0.011</b>         | 0.019            | 0.047             | 87                    |
| NC Boardman River 280014                     | ND                            | 0.010            | <b>0.010</b>         | 0.012            | 0.026             | 75                    |
| NL Ontonagon River 660038                    | ND                            | 0.010            | <b>0.010</b>         | 0.014            | 0.250             | 71                    |
| HE Black River 740267                        | ND                            | 0.001            | <b>0.006</b>         | 0.015            | 0.222             | 48                    |

| <i>Minimally Impacted Sites</i>              | <b>**Total Ammonia (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>             | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM Huron River (Headwaters) 470521           | NQ                            | 0.016            | <b>0.052</b>         | 0.061            | 0.070             | 12                    |
| SM Grand River (Headwaters) 380083           | NQ                            | 0.030            | <b>0.035</b>         | 0.042            | 0.071             | 12                    |
| HE Johnson Drain 821417                      | ND                            | 0.018            | <b>0.035</b>         | 0.062            | 0.240             | 8                     |
| SM Pokagon Creek 140110                      | ND                            | 0.001            | <b>0.023</b>         | 0.030            | 0.050             | 8                     |
| HE Evergreen Creek 790157                    | ND                            | 0.019            | <b>0.022</b>         | 0.031            | 0.034             | 12                    |
| SM River Raisin (Headwaters) 380393          | NQ                            | 0.013            | <b>0.021</b>         | 0.034            | 0.038             | 12                    |
| SM South Branch Kalamazoo River 130331       | ND                            | 0.009            | <b>0.018</b>         | 0.024            | 0.040             | 8                     |
| SM Coldwater River 120215                    | NQ                            | 0.011            | <b>0.018</b>         | 0.025            | 0.050             | 8                     |
| NL Bigelow Creek 630291                      | NQ                            | 0.014            | <b>0.017</b>         | 0.026            | 0.105             | 12                    |
| NL Bear Creek 170154                         | NQ                            | 0.009            | <b>0.017</b>         | 0.019            | 0.022             | 8                     |
| SM South Branch Flint River 440173           | NQ                            | 0.008            | <b>0.015</b>         | 0.021            | 0.027             | 12                    |
| HE Black River (Headwaters) 760058           | ND                            | 0.010            | <b>0.013</b>         | 0.025            | 0.060             | 7                     |
| SM North Branch Clinton River 500467         | NQ                            | 0.011            | <b>0.013</b>         | 0.014            | 0.019             | 8                     |
| NL Bryan Creek 520258                        | NQ                            | 0.010            | <b>0.013</b>         | 0.017            | 0.029             | 8                     |
| NL Pere Marquette River (Headwaters) 430578  | NQ                            | 0.010            | <b>0.012</b>         | 0.016            | 0.018             | 8                     |
| SM Shiawassee River (Headwaters) 631036      | NQ                            | 0.010            | <b>0.011</b>         | 0.017            | 0.019             | 8                     |
| NL Paint River 360124                        | ND                            | 0.010            | <b>0.010</b>         | 0.010            | 0.015             | 12                    |
| NL Perry Creek 680056                        | ND                            | 0.010            | <b>0.010</b>         | 0.012            | 0.022             | 12                    |
| NL Pigeon River 160177                       | NQ                            | 0.010            | <b>0.010</b>         | 0.010            | 0.014             | 8                     |
| NL West Branch Tittabawassee 260068          | ND                            | 0.005            | <b>0.010</b>         | 0.014            | 0.027             | 12                    |
| NL Anderson Creek 830159                     | NQ                            | 0.006            | <b>0.009</b>         | 0.017            | 0.024             | 8                     |
| NL East Creek 280318                         | NQ                            | 0.006            | <b>0.006</b>         | 0.006            | 0.011             | 12                    |
| NL East Branch Ontonagon 310468              | NQ                            | 0.006            | <b>0.006</b>         | 0.006            | 0.011             | 8                     |
| NL Eighteen Mile Creek 210217                | ND                            | 0.006            | <b>0.006</b>         | 0.017            | 0.021             | 8                     |
| NL Fox River 770082                          | NQ                            | 0.006            | <b>0.006</b>         | 0.012            | 0.014             | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | NQ                            | 0.006            | <b>0.006</b>         | 0.006            | 0.010             | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | NQ                            | 0.006            | <b>0.006</b>         | 0.014            | 0.018             | 8                     |
| SM Bellamy Creek 340186                      | ND                            | 0.001            | <b>0.001</b>         | 0.017            | 0.038             | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>pH (mg/L)</b> |                      |                  |                   |                        |
|----------------------------------------------|-------------------|------------------|----------------------|------------------|-------------------|------------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples*</u></b> |
| NL Cheboygan River 160073                    | 7.5               | 8.1              | <b>8.3</b>           | 8.4              | 8.5               |                        |
| HE Shiawassee River 730023                   | 7.3               | 8.0              | <b>8.2</b>           | 8.3              | 9.4               |                        |
| HE Black River 740267                        | 7.5               | 8.0              | <b>8.2</b>           | 8.3              | 8.5               |                        |
| HE Flint River 730285                        | 7.4               | 7.9              | <b>8.1</b>           | 8.4              | 9.1               |                        |
| NL Thunder Bay River 040123                  | 7.0               | 7.9              | <b>8.1</b>           | 8.2              | 8.5               |                        |
| SM St. Joseph River (Lower) 110628           | 6.8               | 7.9              | <b>8.1</b>           | 8.2              | 9.2               |                        |
| SM Grand River (Lower) 700123                | 7.1               | 7.8              | <b>8.1</b>           | 8.2              | 8.9               |                        |
| HE River Raisin 580046                       | 7.2               | 7.8              | <b>8.1</b>           | 8.3              | 8.8               |                        |
| NL Au Sable River 350061                     | 7.5               | 7.9              | <b>8.1</b>           | 8.2              | 9.9               |                        |
| HE Cass River 730024                         | 7.3               | 7.9              | <b>8.0</b>           | 8.2              | 8.5               |                        |
| HE Tittabawassee River 730025                | 7.3               | 7.8              | <b>8.0</b>           | 8.2              | 8.9               |                        |
| NC Boardman River 280014                     | 7.6               | 7.9              | <b>8.0</b>           | 8.2              | 9.1               |                        |
| NC Manistee River 510088                     | 7.5               | 7.8              | <b>8.0</b>           | 8.2              | 8.4               |                        |
| NL Menominee River 550038                    | 6.9               | 7.8              | <b>8.0</b>           | 8.2              | 11.2              |                        |
| SM Grand River (Upper) 340025                | 7.0               | 7.8              | <b>8.0</b>           | 8.1              | 8.9               |                        |
| SM Kalamazoo River (Lower) 030077            | 7.1               | 7.8              | <b>8.0</b>           | 8.2              | 8.8               |                        |
| SM Muskegon River (Lower) 610273             | 7.1               | 7.8              | <b>8.0</b>           | 8.2              | 9.0               |                        |
| NL Muskegon River (Upper) 670008             | 7.3               | 7.7              | <b>7.9</b>           | 8.1              | 8.6               |                        |
| NL Escanaba River 210102                     | 6.8               | 7.8              | <b>7.9</b>           | 8.1              | 8.6               |                        |
| HE Huron River 580364                        | 7.0               | 7.7              | <b>7.9</b>           | 8.1              | 8.8               |                        |
| HE Saginaw River 090177                      | 6.9               | 7.7              | <b>7.9</b>           | 8.1              | 9.6               |                        |
| NL Pine River 490006                         | 7.3               | 7.7              | <b>7.9</b>           | 8.1              | 8.6               |                        |
| SM Kalamazoo River (Upper) 390598            | 7.1               | 7.7              | <b>7.9</b>           | 8.1              | 9.1               |                        |
| SM Pere Marquette River 530027               | 7.0               | 7.7              | <b>7.9</b>           | 8.1              | 8.5               |                        |
| SM St. Joseph River (Upper) 750273           | 7.5               | 7.8              | <b>7.9</b>           | 8.1              | 8.6               |                        |
| NL Ontonagon River 660038                    | 7.1               | 7.6              | <b>7.8</b>           | 7.9              | 8.9               |                        |
| HE Clinton River 500233                      | 7.0               | 7.7              | <b>7.8</b>           | 8.0              | 8.6               |                        |
| HE River Rouge 820070                        | 7.1               | 7.5              | <b>7.7</b>           | 7.9              | 8.6               |                        |
| NL Sturgeon River 210032                     | 6.3               | 7.3              | <b>7.5</b>           | 7.7              | 8.1               |                        |
| NL Manistique River 770073                   | 6.2               | 7.3              | <b>7.5</b>           | 7.7              | 8.3               |                        |
| NL Tahquamenon River 170141                  | 6.5               | 7.2              | <b>7.4</b>           | 7.7              | 8.1               |                        |

| <i>Minimally Impacted Sites</i>             | pH (mg/L)  |           |               |           |            |                 |
|---------------------------------------------|------------|-----------|---------------|-----------|------------|-----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u> | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples*</u> |
| HE Black River (Headwaters) 760058          | 7.9        | 8.2       | <b>8.2</b>    | 8.3       | 8.6        |                 |
| NL Pere Marquette River (Headwaters) 430578 | 7.9        | 8.1       | <b>8.2</b>    | 8.3       | 8.4        |                 |
| NL Pigeon River 160177                      | 8.1        | 8.2       | <b>8.2</b>    | 8.4       | 8.4        |                 |
| NL Bigelow Creek 630291                     | 7.5        | 7.8       | <b>8.1</b>    | 8.2       | 8.4        |                 |
| NL Tahquamenon River (Headwaters) 480033    | 7.7        | 7.8       | <b>8.1</b>    | 8.3       | 8.6        |                 |
| NL Thunder Bay River (Headwaters) 600051    | 8.0        | 8.1       | <b>8.1</b>    | 8.2       | 8.3        |                 |
| SM Coldwater River 120215                   | 7.8        | 8.1       | <b>8.1</b>    | 8.2       | 8.3        |                 |
| HE Evergreen Creek 790157                   | 7.7        | 7.9       | <b>8.1</b>    | 8.2       | 8.5        |                 |
| NL West Branch Tittabawassee 260068         | 7.2        | 7.9       | <b>8.1</b>    | 8.2       | 8.4        |                 |
| NL East Creek 280318                        | 7.7        | 7.8       | <b>8.0</b>    | 8.0       | 8.3        |                 |
| NL Perry Creek 680056                       | 7.6        | 7.9       | <b>8.0</b>    | 8.2       | 8.4        |                 |
| SM South Branch Flint River 440173          | 7.6        | 8.0       | <b>8.0</b>    | 8.2       | 8.8        |                 |
| NL Paint River 360124                       | 7.0        | 7.8       | <b>8.0</b>    | 8.3       | 10.4       |                 |
| SM Bellamy Creek 340186                     | 7.7        | 7.9       | <b>8.0</b>    | 8.2       | 8.4        |                 |
| SM Grand River (Headwaters) 380083          | 6.9        | 7.8       | <b>8.0</b>    | 8.1       | 8.3        |                 |
| SM Pokagon Creek 140110                     | 7.4        | 7.9       | <b>8.0</b>    | 8.0       | 8.2        |                 |
| SM Shiawassee River (Headwaters) 631036     | 6.3        | 7.6       | <b>8.0</b>    | 8.1       | 8.2        |                 |
| NL East Branch Ontonagon 310468             | 7.5        | 7.8       | <b>7.9</b>    | 8.1       | 8.5        |                 |
| SM Huron River (Headwaters) 470521          | 7.6        | 7.7       | <b>7.9</b>    | 8.0       | 8.1        |                 |
| HE Johnson Drain 821417                     | 7.6        | 7.7       | <b>7.9</b>    | 8.2       | 8.2        |                 |
| SM River Raisin (Headwaters) 380393         | 7.5        | 7.8       | <b>7.9</b>    | 8.1       | 8.5        |                 |
| NL Anderson Creek 830159                    | 7.5        | 7.7       | <b>7.8</b>    | 8.0       | 8.1        |                 |
| SM South Branch Kalamazoo River 130331      | 7.6        | 7.7       | <b>7.8</b>    | 7.9       | 8.0        |                 |
| NL Eighteen Mile Creek 210217               | 7.4        | 7.7       | <b>7.8</b>    | 7.9       | 8.1        |                 |
| NL Bryan Creek 520258                       | 7.4        | 7.4       | <b>7.8</b>    | 8.0       | 8.3        |                 |
| SM North Branch Clinton River 500467        | 7.5        | 7.7       | <b>7.7</b>    | 7.9       | 8.2        |                 |
| NL Bear Creek 170154                        | 7.1        | 7.4       | <b>7.6</b>    | 7.8       | 8.1        |                 |
| NL Fox River 770082                         | 7.2        | 7.4       | <b>7.5</b>    | 7.7       | 7.8        |                 |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Turbidity (NTU)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|--------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>        | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| NL Pine River 490006                         | 11.0                     | 21.0             | <b>29.0</b>          | 57.0             | 350.0             | 71                    |
| NL Ontonagon River 660038                    | 7.5                      | 15.0             | <b>22.0</b>          | 50.0             | 550.0             | 70                    |
| HE Cass River 730024                         | 4.1                      | 14.0             | <b>20.7</b>          | 32.0             | 120.0             | 79                    |
| HE Saginaw River 090177                      | 6.6                      | 13.0             | <b>18.0</b>          | 25.0             | 230.0             | 155                   |
| HE Black River 740267                        | 2.2                      | 12.0             | <b>18.0</b>          | 23.0             | 360.0             | 48                    |
| HE Flint River 730285                        | 2.9                      | 10.0             | <b>16.0</b>          | 24.0             | 242.0             | 78                    |
| HE Clinton River 500233                      | 2.7                      | 8.6              | <b>15.0</b>          | 43.0             | 310.0             | 161                   |
| HE River Rouge 820070                        | ND                       | 8.8              | <b>12.9</b>          | 21.0             | 76.0              | 74                    |
| SM Grand River (Lower) 700123                | ND                       | 8.2              | <b>12.0</b>          | 22.0             | 140.0             | 160                   |
| SM Kalamazoo River (Lower) 030077            | 2.2                      | 7.5              | <b>11.9</b>          | 16.0             | 230.0             | 158                   |
| HE Huron River 580364                        | 3.3                      | 6.6              | <b>10.0</b>          | 14.0             | 37.0              | 78                    |
| HE River Raisin 580046                       | 3.5                      | 7.6              | <b>10.0</b>          | 21.0             | 150.0             | 78                    |
| SM Grand River (Upper) 340025                | 2.1                      | 8.0              | <b>10.0</b>          | 17.0             | 620.0             | 78                    |
| HE Shiawassee River 730023                   | 1.6                      | 4.8              | <b>8.9</b>           | 15.0             | 75.0              | 74                    |
| HE Tittabawassee River 730025                | 1.7                      | 5.0              | <b>8.0</b>           | 13.3             | 70.0              | 77                    |
| SM St. Joseph River (Lower) 110628           | ND                       | 4.8              | <b>7.4</b>           | 12.0             | 120.0             | 82                    |
| SM Kalamazoo River (Upper) 390598            | 1.5                      | 3.8              | <b>6.3</b>           | 9.1              | 26.0              | 79                    |
| SM Pere Marquette River 530027               | ND                       | 2.9              | <b>5.6</b>           | 8.5              | 57.0              | 91                    |
| NL Manistique River 770073                   | 2.6                      | 4.0              | <b>5.1</b>           | 6.1              | 12.2              | 78                    |
| NL Sturgeon River 210032                     | 1.9                      | 3.8              | <b>4.7</b>           | 6.0              | 16.0              | 78                    |
| NC Manistee River 510088                     | 1.3                      | 3.5              | <b>4.6</b>           | 6.5              | 15.0              | 71                    |
| NL Muskegon River (Upper) 670008             | ND                       | 3.4              | <b>4.6</b>           | 7.3              | 49.0              | 79                    |
| NL Escanaba River 210102                     | 1.9                      | 3.1              | <b>4.1</b>           | 6.0              | 12.0              | 78                    |
| NL Tahquamenon River 170141                  | 2.0                      | 2.9              | <b>3.8</b>           | 5.3              | 13.0              | 71                    |
| SM St. Joseph River (Upper) 750273           | ND                       | 3.1              | <b>3.8</b>           | 5.0              | 9.5               | 73                    |
| SM Muskegon River (Lower) 610273             | ND                       | 2.1              | <b>3.0</b>           | 4.6              | 290.0             | 162                   |
| NL Menominee River 550038                    | ND                       | 2.2              | <b>2.7</b>           | 3.8              | 16.0              | 87                    |
| NC Boardman River 280014                     | ND                       | 1.0              | <b>1.6</b>           | 2.8              | 17.0              | 75                    |
| NL Thunder Bay River 040123                  | ND                       | 1.0              | <b>1.3</b>           | 1.9              | 6.4               | 72                    |
| NL Au Sable River 350061                     | ND                       | 1.0              | <b>1.0</b>           | 1.0              | 3.7               | 160                   |
| NL Cheboygan River 160073                    | ND                       | 1.0              | <b>1.0</b>           | 1.2              | 3.8               | 72                    |

| <i>Minimally Impacted Sites</i>              | <b>**Turbidity (NTU)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|--------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>        | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 3.6                      | 4.2              | <b>12.0</b>          | 16.5             | 33.0              | 8                     |
| NL Bear Creek 170154                         | 4.0                      | 4.6              | <b>9.1</b>           | 16.5             | 18.0              | 8                     |
| SM South Branch Kalamazoo River 130331       | 2.2                      | 4.0              | <b>7.2</b>           | 9.1              | 11.0              | 8                     |
| HE Black River (Headwaters) 760058           | 2.0                      | 4.3              | <b>6.4</b>           | 8.8              | 13.0              | 8                     |
| SM Grand River (Headwaters) 380083           | 1.7                      | 2.4              | <b>5.9</b>           | 9.4              | 14.0              | 12                    |
| SM Pokagon Creek 140110                      | 2.8                      | 3.9              | <b>5.5</b>           | 9.1              | 22.0              | 8                     |
| NL West Branch Tittabawassee 260068          | 2.9                      | 3.4              | <b>3.8</b>           | 4.8              | 25.0              | 11                    |
| NL East Branch Ontonagon 310468              | ND                       | 1.8              | <b>3.7</b>           | 5.0              | 35.7              | 8                     |
| SM Huron River (Headwaters) 470521           | 1.0                      | 2.3              | <b>3.5</b>           | 6.0              | 8.0               | 12                    |
| HE Evergreen Creek 790157                    | 2.4                      | 3.4              | <b>3.5</b>           | 4.5              | 20.0              | 12                    |
| NL Bigelow Creek 630291                      | ND                       | 1.3              | <b>3.3</b>           | 4.4              | 5.5               | 11                    |
| SM Bellamy Creek 340186                      | ND                       | 2.1              | <b>2.7</b>           | 3.0              | 3.6               | 8                     |
| NL Fox River 770082                          | ND                       | 2.2              | <b>2.5</b>           | 3.1              | 4.1               | 8                     |
| SM Coldwater River 120215                    | ND                       | 1.0              | <b>2.5</b>           | 3.4              | 5.5               | 8                     |
| NL Bryan Creek 520258                        | ND                       | 1.4              | <b>2.4</b>           | 3.1              | 6.3               | 8                     |
| SM South Branch Flint River 440173           | ND                       | 2.0              | <b>2.3</b>           | 3.9              | 7.1               | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | ND                       | 1.0              | <b>2.3</b>           | 3.0              | 4.1               | 8                     |
| NL Anderson Creek 830159                     | ND                       | 0.5              | <b>2.2</b>           | 2.6              | 4.6               | 8                     |
| NL Pigeon River 160177                       | ND                       | 1.1              | <b>2.1</b>           | 3.0              | 5.9               | 8                     |
| NL Perry Creek 680056                        | 1.0                      | 1.4              | <b>2.0</b>           | 2.8              | 4.3               | 12                    |
| SM River Raisin (Headwaters) 380393          | ND                       | 0.5              | <b>1.9</b>           | 2.7              | 5.4               | 12                    |
| NL Eighteen Mile Creek 210217                | ND                       | 1.6              | <b>1.8</b>           | 2.6              | 3.4               | 7                     |
| SM North Branch Clinton River 500467         | ND                       | 1.2              | <b>1.8</b>           | 2.8              | 5.2               | 8                     |
| NL Paint River 360124                        | ND                       | 1.0              | <b>1.4</b>           | 1.9              | 2.5               | 11                    |
| NL East Creek 280318                         | ND                       | 0.5              | <b>1.4</b>           | 2.2              | 8.1               | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | ND                       | 0.5              | <b>0.9</b>           | 1.4              | 4.1               | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | ND                       | 0.5              | <b>0.5</b>           | 0.5              | 1.9               | 8                     |
| SM Shiawassee River (Headwaters) 631036      | ND                       | 0.5              | <b>0.5</b>           | 0.5              | 8.2               | 8                     |



| <i>Intensive &amp; Integrator Sites</i>      | <b>Dissolved Oxygen (mg/L)</b> |                  |                      |                  |                   |                        |
|----------------------------------------------|--------------------------------|------------------|----------------------|------------------|-------------------|------------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>              | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples*</u></b> |
| NC Boardman River 280014                     | 5.5                            | 9.5              | <b>10.6</b>          | 11.4             | 13.5              |                        |
| SM Grand River (Lower) 700123                | 4.5                            | 8.7              | <b>10.0</b>          | 11.5             | 16.9              |                        |
| NL Muskegon River (Upper) 670008             | 7.5                            | 8.5              | <b>9.8</b>           | 11.0             | 13.3              |                        |
| NL Pine River 490006                         | 6.4                            | 8.3              | <b>9.4</b>           | 11.0             | 13.4              |                        |
| SM Pere Marquette River 530027               | 5.2                            | 8.3              | <b>9.4</b>           | 10.4             | 13.4              |                        |
| SM St. Joseph River (Lower) 110628           | 6.6                            | 8.0              | <b>9.4</b>           | 10.5             | 14.9              |                        |
| SM Muskegon River (Lower) 610273             | 6.4                            | 8.2              | <b>9.3</b>           | 11.0             | 13.5              |                        |
| HE River Raisin 580046                       | 5.1                            | 7.9              | <b>9.3</b>           | 10.5             | 14.2              |                        |
| NL Cheboygan River 160073                    | 6.9                            | 8.3              | <b>9.3</b>           | 10.7             | 13.0              |                        |
| NL Sturgeon River 210032                     | 6.5                            | 8.2              | <b>9.3</b>           | 10.2             | 13.0              |                        |
| HE Tittabawassee River 730025                | 6.1                            | 7.8              | <b>9.1</b>           | 10.9             | 16.3              |                        |
| NC Manistee River 510088                     | 7.0                            | 8.2              | <b>9.1</b>           | 10.7             | 13.0              |                        |
| NL Tahquamenon River 170141                  | 6.8                            | 8.0              | <b>9.0</b>           | 10.7             | 14.5              |                        |
| NL Au Sable River 350061                     | 5.9                            | 7.8              | <b>8.9</b>           | 10.9             | 13.8              |                        |
| NL Menominee River 550038                    | 5.6                            | 7.6              | <b>8.9</b>           | 10.9             | 18.4              |                        |
| NL Ontonagon River 660038                    | 6.5                            | 8.0              | <b>8.9</b>           | 10.8             | 13.8              |                        |
| NL Manistique River 770073                   | 6.4                            | 8.0              | <b>8.9</b>           | 9.9              | 12.2              |                        |
| HE Cass River 730024                         | 5.2                            | 7.6              | <b>8.8</b>           | 10.2             | 13.7              |                        |
| SM Grand River (Upper) 340025                | 4.9                            | 7.4              | <b>8.8</b>           | 10.0             | 14.5              |                        |
| SM Kalamazoo River (Lower) 030077            | 4.7                            | 7.5              | <b>8.8</b>           | 10.3             | 13.7              |                        |

| <i>Minimally Impacted Sites</i>             | Dissolved Oxygen (mg/L) |           |               |           |            |                 |
|---------------------------------------------|-------------------------|-----------|---------------|-----------|------------|-----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u>              | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples*</u> |
| NL Tahquamenon River (Headwaters) 480033    | 8.2                     | 9.5       | <b>10.8</b>   | 11.1      | 12.9       |                 |
| NL Pere Marquette River (Headwaters) 430578 | 9.1                     | 9.6       | <b>10.5</b>   | 11.4      | 14.0       |                 |
| NL Anderson Creek 830159                    | 8.4                     | 8.8       | <b>10.4</b>   | 10.5      | 11.8       |                 |
| NL Fox River 770082                         | 9.2                     | 9.8       | <b>10.4</b>   | 10.8      | 12.4       |                 |
| NL East Creek 280318                        | 8.4                     | 9.6       | <b>10.2</b>   | 11.0      | 13.0       |                 |
| NL Bigelow Creek 630291                     | 6.9                     | 8.7       | <b>10.2</b>   | 10.8      | 12.8       |                 |
| NL East Branch Ontonagon 310468             | 9.1                     | 10.0      | <b>10.2</b>   | 11.4      | 12.7       |                 |
| NL Paint River 360124                       | 8.5                     | 9.0       | <b>10.1</b>   | 11.1      | 13.8       |                 |
| NL Eighteen Mile Creek 210217               | 8.6                     | 9.0       | <b>10.1</b>   | 10.7      | 11.3       |                 |
| NL Bryan Creek 520258                       | 7.6                     | 8.8       | <b>10.0</b>   | 10.3      | 10.6       |                 |
| NL Bear Creek 170154                        | 7.4                     | 9.1       | <b>9.9</b>    | 10.6      | 12.4       |                 |
| SM Bellamy Creek 340186                     | 8.2                     | 9.0       | <b>9.8</b>    | 12.0      | 13.6       |                 |
| NL Perry Creek 680056                       | 8.0                     | 9.0       | <b>9.7</b>    | 10.6      | 13.1       |                 |
| NL Pigeon River 160177                      | 7.8                     | 9.0       | <b>9.7</b>    | 11.1      | 12.2       |                 |
| SM South Branch Kalamazoo River 130331      | 8.2                     | 8.7       | <b>9.7</b>    | 11.1      | 12.0       |                 |
| NL West Branch Tittabawassee 260068         | 8.8                     | 9.3       | <b>9.5</b>    | 10.1      | 14.1       |                 |
| HE Evergreen Creek 790157                   | 7.1                     | 8.4       | <b>9.3</b>    | 10.2      | 13.5       |                 |
| SM South Branch Flint River 440173          | 7.7                     | 8.6       | <b>9.2</b>    | 9.8       | 12.2       |                 |
| HE Johnson Drain 821417                     | 7.6                     | 8.0       | <b>8.9</b>    | 9.1       | 9.4        |                 |
| SM Pokagon Creek 140110                     | 7.6                     | 8.3       | <b>8.9</b>    | 10.4      | 11.4       |                 |
| HE                                          |                         |           |               |           |            |                 |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Total Alkalinity (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|----------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM Kalamazoo River (Upper) 390598            | 106                              | 199              | <b>227</b>           | 247              | 272               | 79                    |
| HE Black River 740267                        | 62                               | 180              | <b>216</b>           | 227              | 284               | 48                    |
| HE Shiawassee River 730023                   | 109                              | 189              | <b>212</b>           | 226              | 254               | 74                    |
| HE Cass River 730024                         | 101                              | 180              | <b>210</b>           | 229              | 271               | 79                    |
| SM Grand River (Upper) 340025                | 94                               | 174              | <b>210</b>           | 234              | 269               | 79                    |
| SM St. Joseph River (Lower) 110628           | 118                              | 198              | <b>210</b>           | 220              | 236               | 80                    |
| SM St. Joseph River (Upper) 750273           | 133                              | 185              | <b>198</b>           | 205              | 224               | 74                    |
| SM Kalamazoo River (Lower) 030077            | 110                              | 179              | <b>192</b>           | 217              | 245               | 160                   |
| SM Grand River (Lower) 700123                | 47                               | 162              | <b>190</b>           | 220              | 253               | 160                   |
| HE Flint River 730285                        | 64                               | 160              | <b>184</b>           | 202              | 240               | 78                    |
| HE Huron River 580364                        | 129                              | 168              | <b>183</b>           | 200              | 240               | 79                    |
| HE River Raisin 580046                       | 68                               | 144              | <b>178</b>           | 213              | 240               | 78                    |
| HE Clinton River 500233                      | 36                               | 142              | <b>172</b>           | 194              | 260               | 161                   |
| HE Saginaw River 090177                      | 63                               | 153              | <b>170</b>           | 190              | 233               | 155                   |
| NL Thunder Bay River 040123                  | 104                              | 145              | <b>163</b>           | 174              | 195               | 73                    |
| HE Tittabawassee River 730025                | 104                              | 145              | <b>159</b>           | 172              | 200               | 79                    |
| NC Boardman River 280014                     | 93                               | 135              | <b>145</b>           | 152              | 162               | 75                    |
| NL Cheboygan River 160073                    | 120                              | 132              | <b>138</b>           | 143              | 160               | 72                    |
| SM Pere Marquette River 530027               | 58                               | 126              | <b>138</b>           | 146              | 250               | 78                    |
| NC Manistee River 510088                     | 99                               | 124              |                      |                  |                   |                       |

| <i>Minimally Impacted Sites</i>              | <b>**Total Alkalinity (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|----------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM North Branch Clinton River 500467         | 98                               | 251              | <b>304</b>           | 331              | 334               | 8                     |
| HE Johnson Drain 821417                      | 199                              | 223              | <b>279</b>           | 285              | 286               | 8                     |
| SM Bellamy Creek 340186                      | 212                              | 252              | <b>273</b>           | 287              | 290               | 8                     |
| SM South Branch Kalamazoo River 130331       | 206                              | 224              | <b>245</b>           | 252              | 258               | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 230                              | 237              | <b>244</b>           | 249              | 271               | 8                     |
| SM South Branch Flint River 440173           | 208                              | 221              | <b>242</b>           | 263              | 292               | 12                    |
| HE Black River (Headwaters) 760058           | 148                              | 205              | <b>238</b>           | 248              | 267               | 8                     |
| SM Grand River (Headwaters) 380083           | 151                              | 219              | <b>232</b>           | 245              | 260               | 12                    |
| SM Pokagon Creek 140110                      | 149                              | 215              | <b>222</b>           | 232              | 236               | 8                     |
| HE Evergreen Creek 790157                    | 170                              | 180              | <b>190</b>           | 202              | 217               | 12                    |
| NL Pigeon River 160177                       | 178                              | 183              | <b>186</b>           | 197              | 204               | 8                     |
| SM River Raisin (Headwaters) 380393          | 159                              | 174              | <b>186</b>           | 194              | 218               | 12                    |
| NL Perry Creek 680056                        | 152                              | 180              | <b>183</b>           | 189              | 204               | 12                    |
| SM Coldwater River 120215                    | 168                              | 175              | <b>181</b>           | 186              | 199               | 8                     |
| SM Huron River (Headwaters) 470521           | 157                              | 177              | <b>180</b>           | 209              | 220               | 12                    |
| NL Anderson Creek 830159                     | 75                               | 135              | <b>178</b>           | 187              | 190               | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 170                              | 172              | <b>174</b>           | 184              | 190               | 8                     |
| NL West Branch Tittabawassee 260068          | 138                              | 146              | <b>168</b>           | 174              | 182               | 12                    |
| NL East Creek 280318                         | 85                               | 116              | <b>148</b>           | 152              | 160               | 12                    |
| NL Bigelow Creek 630291                      | 100                              | 124              | <                    |                  |                   |                       |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>Total Hardness (mg/L)</b> |                      |                  |                   |                        |
|----------------------------------------------|-------------------|------------------------------|----------------------|------------------|-------------------|------------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>             | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples*</u></b> |
| HE Huron River 580364                        | 225               | 301                          | <b>351</b>           | 426              | 610               |                        |
| HE Black River 740267                        | 122               | 278                          | <b>298</b>           | 320              | 380               |                        |
| HE Cass River 730024                         | 95                | 260                          | <b>284</b>           | 317              | 394               |                        |
| SM Grand River (Upper) 340025                | 167               | 249                          | <b>282</b>           | 301              | 337               |                        |
| SM Kalamazoo River (Upper) 390598            | 145               | 247                          | <b>279</b>           | 299              | 320               |                        |
| HE Shiawassee River 730023                   | 134               | 255                          | <b>269</b>           | 284              | 347               |                        |
| HE River Raisin 580046                       | 142               | 215                          | <b>266</b>           | 301              | 334               |                        |
| SM St. Joseph River (Lower) 110628           | 150               | 249                          | <b>263</b>           | 275              | 297               |                        |
| SM Grand River (Lower) 700123                | 160               | 231                          | <b>260</b>           | 284              | 329               |                        |
| HE Clinton River 500233                      | 75                | 207                          | <b>251</b>           | 277              | 395               |                        |
| HE Flint River 730285                        | 150               | 232                          | <b>250</b>           | 270              | 346               |                        |
| SM St. Joseph River (Upper) 750273           | 135               | 239                          | <b>250</b>           | 260              | 287               |                        |
| SM Kalamazoo River (Lower) 030077            | 146               | 228                          | <b>245</b>           | 262              | 315               |                        |
| HE Saginaw River 090177                      | 155               | 217                          | <b>234</b>           | 252              | 300               |                        |
| HE Tittabawassee River 730025                | 158               | 205                          | <b>226</b>           | 234              | 275               |                        |
| NL Thunder Bay River 040123                  | 123               | 166                          | <b>177</b>           | 189              | 235               |                        |
| SM Pere Marquette River 530027               | 108               | 150                          | <b>167</b>           | 175              | 190               |                        |
| NC Boardman River 280014                     | 122               | 155                          | <b>165</b>           | 169              | 190               |                        |
| SM Muskegon River (Lower) 610273             | 117               | 149                          | <b>165</b>           | 174              | 209               |                        |
| NL Muskegon River (Upper) 670008             | 81                | 129                          | <b>161</b> </        |                  |                   |                        |

| <i>Minimally Impacted Sites</i>             | Total Hardness (mg/L) |           |               |           |            |                 |
|---------------------------------------------|-----------------------|-----------|---------------|-----------|------------|-----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u>            | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples*</u> |
| SM North Branch Clinton River 500467        | 260                   | 335       | <b>353</b>    | 364       | 379        |                 |
| HE Johnson Drain 821417                     | 265                   | 339       | <b>348</b>    | 360       | 382        |                 |
| HE Black River (Headwaters) 760058          | 241                   | 300       | <b>330</b>    | 350       | 394        |                 |
| SM Bellamy Creek 340186                     | 283                   | 296       | <b>321</b>    | 325       | 343        |                 |
| SM South Branch Flint River 440173          | 259                   | 273       | <b>299</b>    | 308       | 350        |                 |
| SM South Branch Kalamazoo River 130331      | 256                   | 294       | <b>297</b>    | 303       | 310        |                 |
| SM Grand River (Headwaters) 380083          | 188                   | 262       | <b>276</b>    | 281       | 291        |                 |
| SM Shiawassee River (Headwaters) 631036     | 252                   | 258       | <b>269</b>    | 276       | 282        |                 |
| SM Huron River (Headwaters) 470521          | 236                   | 251       | <b>263</b>    | 270       | 319        |                 |
| SM Pokagon Creek 140110                     | 225                   | 250       | <b>260</b>    | 273       | 285        |                 |
| SM Coldwater River 120215                   | 220                   | 231       | <b>244</b>    | 247       | 263        |                 |
| HE Evergreen Creek 790157                   | 207                   | 221       | <b>236</b>    | 250       | 264        |                 |
| SM River Raisin (Headwaters) 380393         | 210                   | 221       | <b>229</b>    | 235       | 250        |                 |
| NL Anderson Creek 830159                    | 96                    | 168       | <b>206</b>    | 219       | 225        |                 |
| NL Pigeon River 160177                      | 190                   | 196       | <b>203</b>    | 205       | 211        |                 |
| NL Perry Creek 680056                       | 173                   | 194       | <b>200</b>    | 203       | 208        |                 |
| NL Thunder Bay River (Headwaters) 600051    | 182                   | 189       | <b>191</b>    | 194       | 196        |                 |
| NL West Branch Tittabawassee 260068         | 161                   | 177       | <b>187</b>    | 195       | 202        |                 |
| NL East Creek 280318                        | 124                   | 155       | <b>170</b>    | 176       | 190        |                 |
| NL Bigelow Creek 630291                     | 113                   | 153       | <b>160</b>    | 165       | 173        |                 |
| NL Pere Marquette River (Headwaters) 430578 | 142                   | 154       |               |           |            |                 |

| <i>Intensive &amp; Integrator Sites</i>      | <b>Specific Conductance (µS/cm)</b> |                  |                      |                  |                   |                        |
|----------------------------------------------|-------------------------------------|------------------|----------------------|------------------|-------------------|------------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                   | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples*</u></b> |
| HE Huron River 580364                        | 257                                 | 845              | <b>950</b>           | 1055             | 1800              |                        |
| HE Clinton River 500233                      | 302                                 | 725              | <b>907</b>           | 1033             | 1460              |                        |
| HE Flint River 730285                        | 347                                 | 622              | <b>699</b>           | 760              | 957               |                        |
| HE Shiawassee River 730023                   | 355                                 | 648              | <b>689</b>           | 712              | 816               |                        |
| HE Black River 740267                        | 275                                 | 630              | <b>677</b>           | 728              | 844               |                        |
| SM Grand River (Upper) 340025                | 420                                 | 579              | <b>663</b>           | 700              | 2765              |                        |
| HE Saginaw River 090177                      | 285                                 | 550              | <b>654</b>           | 721              | 947               |                        |
| HE Cass River 730024                         | 350                                 | 580              | <b>642</b>           | 678              | 800               |                        |
| HE Tittabawassee River 730025                | 373                                 | 522              | <b>633</b>           | 770              | 1084              |                        |
| HE River Raisin 580046                       | 354                                 | 540              | <b>618</b>           | 668              | 775               |                        |
| SM Grand River (Lower) 700123                | 345                                 | 553              | <b>618</b>           | 674              | 800               |                        |
| SM Kalamazoo River (Upper) 390598            | 330                                 | 523              | <b>615</b>           | 660              | 696               |                        |
| SM Kalamazoo River (Lower) 030077            | 389                                 | 524              | <b>576</b>           | 603              | 748               |                        |
| SM St. Joseph River (Lower) 110628           | 356                                 | 542              | <b>568</b>           | 588              | 631               |                        |
| HE River Rouge 820070                        | 238                                 | 461              | <b>530</b>           | 700              | 1247              |                        |
| SM St. Joseph River (Upper) 750273           | 350                                 | 490              | <b>510</b>           | 528              | 557               |                        |
| NL Escanaba River 210102                     | 152                                 | 291              | <b>399</b>           | 514              | 775               |                        |
| SM Muskegon River (Lower) 610273             | 244                                 | 316              | <b>357</b>           | 380              | 749               |                        |
| NL Thunder Bay River 040123                  | 240                                 | 334              | <b>352</b>           | 369              | 414               |                        |
| SM Pere Marquette River 530027               | 202                                 | 302              | <b>344</b>           | 366              | 387               |                        |

| <i>Minimally Impacted Sites</i>          | Specific Conductance (µS/cm) |           |               |           |            |                 |
|------------------------------------------|------------------------------|-----------|---------------|-----------|------------|-----------------|
| <u>Ecoregion / Site Name / STORET</u>    | <u>Min</u>                   | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples*</u> |
| HE Johnson Drain 821417                  | 800                          | 852       | <b>1037</b>   | 1266      | 1710       |                 |
| SM Huron River (Headwaters) 470521       | 744                          | 764       | <b>828</b>    | 847       | 992        |                 |
| HE Black River (Headwaters) 760058       | 756                          | 795       | <b>817</b>    | 838       | 869        |                 |
| SM North Branch Clinton River 500467     | 479                          | 652       | <b>687</b>    | 697       | 716        |                 |
| SM Bellamy Creek 340186                  | 575                          | 602       | <b>625</b>    | 648       | 680        |                 |
| SM Shiawassee River (Headwaters) 631036  | 544                          | 597       | <b>606</b>    | 638       | 670        |                 |
| SM South Branch Kalamazoo River 130331   | 500                          | 576       | <b>596</b>    | 608       | 626        |                 |
| SM South Branch Flint River 440173       | 549                          | 565       | <b>592</b>    | 644       | 1142       |                 |
| SM Coldwater River 120215                | 486                          | 510       | <b>541</b>    | 549       | 629        |                 |
| SM Grand River (Headwaters) 380083       | 383                          | 522       | <b>537</b>    | 547       | 819        |                 |
| SM Pokagon Creek 140110                  | 428                          | 468       | <b>498</b>    | 527       | 534        |                 |
| SM River Raisin (Headwaters) 380393      | 451                          | 480       | <b>491</b>    | 502       | 529        |                 |
| HE Evergreen Creek 790157                | 418                          | 455       | <b>482</b>    | 494       | 524        |                 |
| NL Pigeon River 160177                   | 362                          | 384       | <b>388</b>    | 394       | 408        |                 |
| NL Anderson Creek 830159                 | 193                          | 330       | <b>387</b>    | 412       | 431        |                 |
| NL Perry Creek 680056                    | 334                          | 379       | <b>387</b>    | 407       | 424        |                 |
| NL Thunder Bay River (Headwaters) 600051 | 362                          | 372       | <b>377</b>    | 380       | 393        |                 |
| NL West Branch Tittabawassee 260068      | 292                          | 331       | <b>349</b>    | 368       | 718        |                 |
| NL East Creek 280318                     | 244                          | 305       | <b>341</b>    | 354       | 365        |                 |



| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Total Suspended Solids (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|----------------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>                       | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Flint River 730285                        | ND                | 14                                     | <b>25</b>            | 44               | 304               | 78                    |
| SM Grand River (Lower) 700123                | ND                | 13                                     | <b>24</b>            | 35               | 150               | 174                   |
| HE Cass River 730024                         | 5                 | 15                                     | <b>21</b>            | 36               | 120               | 79                    |
| NL Pine River 490006                         | 4                 | 14                                     | <b>21</b>            | 44               | 460               | 71                    |
| HE Clinton River 500233                      | ND                | 11                                     | <b>20</b>            | 45               | 320               | 159                   |
| HE Saginaw River 090177                      | 6                 | 13                                     | <b>18</b>            | 26               | 336               | 156                   |
| HE Black River 740267                        | 4                 | 12                                     | <b>18</b>            | 26               | 410               | 48                    |
| SM Kalamazoo River (Lower) 030077            | ND                | 12                                     | <b>18</b>            | 27               | 270               | 174                   |
| HE Shiawassee River 730023                   | ND                | 9                                      | <b>17</b>            | 24               | 100               | 74                    |
| SM Grand River (Upper) 340025                | ND                | 10                                     | <b>15</b>            | 20               | 830               | 79                    |
| SM St. Joseph River (Lower) 110628           | ND                | 9                                      | <b>15</b>            | 25               | 97                | 91                    |
| HE Huron River 580364                        | 4                 | 10                                     | <b>14</b>            | 22               | 175               | 78                    |
| HE River Rouge 820070                        | NQ                | 9                                      | <b>14</b>            | 23               | 64                | 74                    |
| NL Ontonagon River 660038                    | NQ                | 10                                     | <b>14</b>            | 37               | 1700              | 71                    |
| HE Tittabawassee River 730025                | ND                | 7                                      | <b>13</b>            | 23               | 91                | 79                    |
| SM Kalamazoo River (Upper) 390598            | ND                | 7                                      | <b>12</b>            | 18               | 75                | 79                    |
| SM Pere Marquette River 530027               | ND                | 6                                      | <b>12</b>            | 17               | 75                | 91                    |
| HE River Raisin 580046                       | 4                 | 8                                      | <b>11</b>            | 18               | 290               | 78                    |
| NL Muskegon River (Upper) 670008             | ND                | 5                                      | <b>10</b>            | 16               | 140               | 80                    |
| NC Manistee River 510088                     | ND                | 5                                      | <b>8</b>             | 12               | 51                | 71                    |
| SM Muskegon River (Lower) 610273             | ND                | 4                                      | <b>8</b>             | 13               | 390               | 173                   |
| SM St. Joseph River (Upper) 750273           | ND                | 4                                      | <b>6</b>             | 9                | 24                | 74                    |
| NL Manistique River 770073                   | ND                | 4                                      | <b>5</b>             | 8                | 41                | 91                    |
| NC Boardman River 280014                     | ND                | 4                                      | <b>4</b>             | 7                | 75                | 75                    |
| NL Au Sable River 350061                     | ND                | 1                                      | <b>4</b>             | 4                | 20                | 160                   |
| NL Cheboygan River 160073                    | ND                | 1                                      | <b>4</b>             | 4                | 7                 | 73                    |
| NL Escanaba River 210102                     | ND                | 4                                      | <b>4</b>             | 6                | 19                | 91                    |
| NL Menominee River 550038                    | ND                | 4                                      | <b>4</b>             | 7                | 42                | 87                    |
| NL Sturgeon River 210032                     | ND                | 4                                      | <b>4</b>             | 7                | 58                | 79                    |
| NL Tahquamenon River 170141                  | ND                | 4                                      | <b>4</b>             | 5                | 29                | 84                    |
| NL Thunder Bay River 040123                  | ND                | 1                                      | <b>4</b>             | 4                | 10                | 73                    |

| <i>Minimally Impacted Sites</i>              | <b>**Total Suspended Solids (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|----------------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                      | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM Pokagon Creek 140110                      | 7                                      | 10               | <b>16</b>            | 32               | 61                | 8                     |
| HE Johnson Drain 821417                      | NQ                                     | 5                | <b>14</b>            | 18               | 36                | 8                     |
| SM South Branch Kalamazoo River 130331       | ND                                     | 9                | <b>12</b>            | 17               | 22                | 8                     |
| NL Bear Creek 170154                         | ND                                     | 4                | <b>11</b>            | 15               | 21                | 8                     |
| HE Black River (Headwaters) 760058           | 4                                      | 6                | <b>9</b>             | 11               | 12                | 8                     |
| SM Grand River (Headwaters) 380083           | NQ                                     | 4                | <b>9</b>             | 25               | 30                | 12                    |
| NL Bigelow Creek 630291                      | NQ                                     | 5                | <b>8</b>             | 9                | 57                | 12                    |
| SM Huron River (Headwaters) 470521           | ND                                     | 4                | <b>7</b>             | 12               | 20                | 12                    |
| NL West Branch Tittabawassee 260068          | NQ                                     | 5                | <b>7</b>             | 10               | 51                | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | NQ                                     | 4                | <b>6</b>             | 8                | 9                 | 8                     |
| SM River Raisin (Headwaters) 380393          | ND                                     | 2                | <b>5</b>             | 8                | 16                | 12                    |
| NL Pigeon River 160177                       | ND                                     | 2                | <b>5</b>             | 6                | 12                | 8                     |
| SM South Branch Flint River 440173           | ND                                     | 4                | <b>5</b>             | 9                | 17                | 12                    |
| HE Evergreen Creek 790157                    | ND                                     | 4                | <b>5</b>             | 7                | 46                | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | ND                                     | 4                | <b>5</b>             | 6                | 11                | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | ND                                     | 4                | <b>5</b>             | 7                | 8                 | 8                     |
| SM North Branch Clinton River 500467         | ND                                     | 4                | <b>4</b>             | 5                | 10                | 8                     |
| SM Coldwater River 120215                    | ND                                     | 4                | <b>4</b>             | 7                | 7                 | 8                     |
| SM Bellamy Creek 340186                      | ND                                     | 2                | <b>4</b>             | 4                | 4                 | 8                     |
| NL Perry Creek 680056                        | ND                                     | 1                | <b>4</b>             | 5                | 6                 | 11                    |
| NL East Branch Ontonagon 310468              | ND                                     | 4                | <b>4</b>             | 7                | 37                | 8                     |
| NL Bryan Creek 520258                        | ND                                     | 4                | <b>4</b>             | 6                | 8                 | 8                     |
| NL East Creek 280318                         | ND                                     | 4                | <b>4</b>             | 5                | 21                | 12                    |
| NL Fox River 770082                          | ND                                     | 3                | <b>4</b>             | 6                | 7                 | 8                     |
| NL Eighteen Mile Creek 210217                | ND                                     | 2                | <b>4</b>             | 8                | 42                | 8                     |
| NL Anderson Creek 830159                     | NQ                                     | 3                | <b>3</b>             | 9                | 18                | 8                     |
| SM Shiawassee River (Headwaters) 631036      | ND                                     | 1                | <b>3</b>             | 4                | 28                | 8                     |
| NL Paint River 360124                        | ND                                     | 1                | <b>2</b>             | 4                | 6                 | 12                    |

| <i>Intensive &amp; Integrator Sites</i>      | <b>Total Dissolved Solids (mg/L)</b> |                  |                      |                  |                   |                        |
|----------------------------------------------|--------------------------------------|------------------|----------------------|------------------|-------------------|------------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                    | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples*</u></b> |
| HE Huron River 580364                        | 420                                  | 540              | <b>600</b>           | 680              | 840               |                        |
| HE Clinton River 500233                      | 210                                  | 480              | <b>600</b>           | 690              | 1260              |                        |
| HE Flint River 730285                        | 212                                  | 410              | <b>465</b>           | 520              | 650               |                        |
| HE Shiawassee River 730023                   | 250                                  | 420              | <b>450</b>           | 480              | 580               |                        |
| HE Black River 740267                        | 180                                  | 420              | <b>450</b>           | 480              | 580               |                        |
| HE Saginaw River 090177                      | 240                                  | 360              | <b>440</b>           | 480              | 610               |                        |
| HE Tittabawassee River 730025                | 236                                  | 340              | <b>440</b>           | 510              | 690               |                        |
| HE Cass River 730024                         | 230                                  | 380              | <b>430</b>           | 450              | 540               |                        |
| SM Grand River (Upper) 340025                | 256                                  | 390              | <b>430</b>           | 460              | 510               |                        |
| SM Grand River (Lower) 700123                | 192                                  | 360              | <b>410</b>           | 450              | 510               |                        |
| SM Kalamazoo River (Upper) 390598            | 220                                  | 360              | <b>410</b>           | 434              | 470               |                        |
| HE River Raisin 580046                       | 240                                  | 340              | <b>390</b>           | 431              | 490               |                        |
| SM Kalamazoo River (Lower) 030077            | 204                                  | 350              | <b>380</b>           | 400              | 460               |                        |
| SM St. Joseph River (Lower) 110628           | 200                                  | 360              | <b>380</b>           | 390              | 420               |                        |
| HE River Rouge 820070                        | 190                                  | 310              | <b>355</b>           | 443              | 790               |                        |
| SM St. Joseph River (Upper) 750273           | 192                                  | 330              | <b>340</b>           | 350              | 380               |                        |
| NL Escanaba River 210102                     | 100                                  | 180              | <b>255</b>           | 343              | 530               |                        |
| SM Muskegon River (Lower) 610273             | 108                                  | 210              | <b>240</b>           | 251              | 290               |                        |
| NL Thunder Bay River 040123                  | 170                                  | 220              | <b>230</b>           | 240              | 290               |                        |
| NL Muskegon River (Upper) 670008             | 110                                  | 190              | <b>230</b>           | 250              | 320               |                        |
| SM Pere Marquette River 530027               | 150                                  | 209              | <b>230</b>           | 240              | 310               |                        |
| NC Boardman River 280014                     | 124                                  | 210              | <b>220</b>           | 220              | 296               |                        |
| NC Manistee River 510088                     | 132                                  | 210              | <b>220</b>           | 230              | 260               |                        |
| NL Cheboygan River 160073                    | 200                                  | 204              | <b>210</b>           | 220              | 230               |                        |
| NL Au Sable River 350061                     | 84                                   | 190              | <b>200</b>           | 200              | 240               |                        |
| NL Menominee River 550038                    | 70                                   | 158              | <b>180</b>           | 200              | 230               |                        |
| NL Sturgeon River 210032                     | 45                                   | 115              | <b>150</b>           | 170              | 210               |                        |
| NL Pine River 490006                         | 70                                   | 110              | <b>130</b>           | 150              | 192               |                        |
| NL Manistique River 770073                   | 47                                   | 100              | <b>120</b>           | 135              | 190               |                        |
| NL Ontonagon River 660038                    | 50                                   | 84               | <b>100</b>           | 110              | 156               |                        |
| NL Tahquamenon River 170141                  | 30                                   | 72               | <b>100</b>           | 120              | 140               |                        |

| <i>Minimally Impacted Sites</i>             | Total Dissolved Solids (mg/L) |           |               |           |            |                 |
|---------------------------------------------|-------------------------------|-----------|---------------|-----------|------------|-----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u>                    | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples*</u> |
| HE Johnson Drain 821417                     | 520                           | 550       | <b>665</b>    | 848       | 1100       |                 |
| SM Huron River (Headwaters) 470521          | 510                           | 510       | <b>545</b>    | 560       | 580        |                 |
| HE Black River (Headwaters) 760058          | 460                           | 515       | <b>530</b>    | 555       | 590        |                 |
| SM North Branch Clinton River 500467        | 320                           | 433       | <b>445</b>    | 450       | 470        |                 |
| SM Bellamy Creek 340186                     | 380                           | 405       | <b>415</b>    | 433       | 440        |                 |
| SM Shiawassee River (Headwaters) 631036     | 390                           | 398       | <b>400</b>    | 410       | 430        |                 |
| SM South Branch Flint River 440173          | 244                           | 370       | <b>390</b>    | 400       | 440        |                 |
| SM South Branch Kalamazoo River 130331      | 340                           | 380       | <b>390</b>    | 400       | 410        |                 |
| SM Coldwater River 120215                   | 320                           | 330       | <b>360</b>    | 363       | 400        |                 |
| SM Grand River (Headwaters) 380083          | 260                           | 340       | <b>350</b>    | 370       | 380        |                 |
| SM Pokagon Creek 140110                     | 290                           | 338       | <b>340</b>    | 343       | 350        |                 |
| SM River Raisin (Headwaters) 380393         | 292                           | 320       | <b>324</b>    | 330       | 350        |                 |
| HE Evergreen Creek 790157                   | 270                           | 298       | <b>320</b>    | 333       | 350        |                 |
| NL Anderson Creek 830159                    | 130                           | 220       | <b>265</b>    | 280       | 280        |                 |
| NL Perry Creek 680056                       | 250                           | 260       | <b>260</b>    | 270       | 290        |                 |
| NL Pigeon River 160177                      | 240                           | 250       | <b>250</b>    | 260       | 260        |                 |
| NL Thunder Bay River (Headwaters) 600051    | 230                           | 240       | <b>240</b>    | 250       | 250        |                 |
| NL West Branch Tittabawassee 260068         | 200                           | 228       | <b>240</b>    | 250       | 250        |                 |
| NL East Creek 280318                        | 132                           | 190       | <b>225</b>    | 240       | 292        |                 |
| NL Bigelow Creek 630291                     | 150                           | 210       | <b>220</b>    | 220       | 230        |                 |
| NL Pere Marquette River (Headwaters) 430578 | 190                           | 200       | <b>210</b>    | 213       | 230        |                 |
| NL Bryan Creek 520258                       | 100                           | 148       | <b>160</b>    | 170       | 170        |                 |
| NL Bear Creek 170154                        | 90                            | 108       | <b>140</b>    | 168       | 220        |                 |
| NL Eighteen Mile Creek 210217               | 88                            | 114       | <b>130</b>    | 160       | 160        |                 |
| NL Paint River 360124                       | 50                            | 90        | <b>100</b>    | 103       | 120        |                 |
| NL Tahquamenon River (Headwaters) 480033    | 90                            | 90        | <b>93</b>     | 97        | 100        |                 |
| NL East Branch Ontonagon 310468             | 90                            | 90        | <b>90</b>     | 100       | 152        |                 |
| NL Fox River 770082                         | 60                            | 72        | <b>80</b>     | 80        | 80         |                 |

| <i>Intensive &amp; Integrator Sites</i>      | <b>Total Organic Carbon (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|------------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>                  | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| NL Escanaba River 210102                     | 11.0                               | 17.0             | <b>19.0</b>          | 21.0             | 32.0              | 90                    |
| NL Tahquamenon River 170141                  | 4.4                                | 10.0             | <b>16.0</b>          | 21.0             | 36.0              | 84                    |
| NL Sturgeon River 210032                     | 6.6                                | 10.0             | <b>15.0</b>          | 20.0             | 33.0              | 79                    |
| NL Pine River 490006                         | 5.3                                | 8.4              | <b>14.0</b>          | 19.0             | 26.0              | 71                    |
| NL Menominee River 550038                    | 6.0                                | 8.1              | <b>10.0</b>          | 13.0             | 20.0              | 87                    |
| NL Manistique River 770073                   | 4.4                                | 7.0              | <b>9.6</b>           | 13.0             | 26.0              | 92                    |
| NL Ontonagon River 660038                    | 4.0                                | 6.5              | <b>9.1</b>           | 12.0             | 19.0              | 71                    |
| SM Grand River (Upper) 340025                | 2.3                                | 7.0              | <b>8.7</b>           | 10.0             | 16.0              | 79                    |
| HE Cass River 730024                         | 4.4                                | 7.3              | <b>8.6</b>           | 9.7              | 13.0              | 79                    |
| HE Black River 740267                        | 3.6                                | 5.4              | <b>8.6</b>           | 10.0             | 16.0              | 48                    |
| HE Saginaw River 090177                      | 2.9                                | 7.5              | <b>8.2</b>           | 9.4              | 15.0              | 155                   |
| HE Flint River 730285                        | 1.2                                | 7.4              | <b>8.2</b>           | 8.9              | 18.0              | 78                    |
| NL Thunder Bay River 040123                  | 4.7                                | 6.4              | <b>7.9</b>           | 9.9              | 19.0              | 72                    |
| HE Tittabawassee River 730025                | 5.1                                | 6.7              | <b>7.8</b>           | 9.3              | 13.0              | 79                    |
| SM Grand River (Lower) 700123                | 3.5                                | 6.0              | <b>7.4</b>           | 8.5              | 11.4              | 174                   |
| HE Shiawassee River 730023                   | 0.5                                | 6.1              | <b>7.1</b>           | 8.5              | 13.0              | 74                    |
| HE Clinton River 500233                      | 5.3                                | 6.1              | <b>6.9</b>           | 8.2              | 16.0              | 161                   |
| NL Muskegon River (Upper) 670008             | 2.9                                | 4.8              | <b>6.9</b>           | 9.3              | 15.0              | 80                    |
| HE Huron River 580364                        | 5.2                                | 6.1              | <b>6.7</b>           | 7.4              | 9.1               | 78                    |
| SM Muskegon River (Lower) 610273             | 3.5                                | 5.4              | <b>6.2</b>           | 7.8              | 12.0              | 173                   |
| HE River Raisin 580046                       | 2.7                                | 5.4              | <b>6.2</b>           | 7.1              | 16.2              | 78                    |
| SM Kalamazoo River (Lower) 030077            | 3.1                                | 5.0              | <b>6.2</b>           | 7.2              | 10.4              | 174                   |
| SM Kalamazoo River (Upper) 390598            | 2.6                                | 4.6              | <b>6.0</b>           | 8.4              | 13.0              | 79                    |
| SM St. Joseph River (Upper) 750273           | 3.5                                | 4.7              | <b>5.4</b>           | 6.1              | 21.0              | 74                    |
| SM St. Joseph River (Lower) 110628           | ND                                 | 4.2              | <b>5.1</b>           | 6.0              | 8.9               | 91                    |
| NL Cheboygan River 160073                    | 2.6                                | 4.7              | <b>5.0</b>           | 5.6              | 7.3               | 73                    |
| SM Pere Marquette River 530027               | 1.1                                | 3.1              | <b>4.1</b>           | 6.7              | 17.0              | 90                    |
| HE River Rouge 820070                        | 1.4                                | 3.0              | <b>3.7</b>           | 4.9              | 9.5               | 73                    |
| NL Au Sable River 350061                     | 1.3                                | 2.7              | <b>3.5</b>           | 4.8              | 9.6               | 160                   |
| NC Manistee River 510088                     | 1.8                                | 2.6              | <b>3.4</b>           | 4.5              | 10.0              | 71                    |
| NC Boardman River 280014                     | 1.8                                | 2.2              | <b>2.9</b>           | 4.2              | 11.3              | 75                    |

| <i>Minimally Impacted Sites</i>             | Total Organic Carbon (mg/L) |           |               |           |            |                |
|---------------------------------------------|-----------------------------|-----------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u>                  | <u>Q1</u> | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| NL Bear Creek 170154                        | 7.0                         | 11.6      | <b>15.0</b>   | 18.5      | 29.0       | 8              |
| NL Eighteen Mile Creek 210217               | 4.3                         | 6.4       | <b>10.5</b>   | 16.5      | 26.0       | 8              |
| HE Black River (Headwaters) 760058          | 5.5                         | 6.5       | <b>8.2</b>    | 10.8      | 12.0       | 8              |
| NL Bryan Creek 520258                       | 2.9                         | 4.1       | <b>7.1</b>    | 14.5      | 26.0       | 8              |
| SM South Branch Flint River 440173          | 4.7                         | 5.1       | <b>6.9</b>    | 7.5       | 9.7        | 12             |
| HE Evergreen Creek 790157                   | 4.8                         | 5.6       | <b>6.7</b>    | 7.2       | 7.9        | 12             |
| SM River Raisin (Headwaters) 380393         | 5.3                         | 5.7       | <b>6.7</b>    | 7.3       | 7.6        | 12             |
| NL Anderson Creek 830159                    | 3.6                         | 3.9       | <b>6.7</b>    | 8.7       | 10.0       | 8              |
| NL East Branch Ontonagon 310468             | 3.2                         | 5.2       | <b>6.5</b>    | 8.7       | 12.0       | 8              |
| SM Bellamy Creek 340186                     | 3.5                         | 4.7       | <b>6.4</b>    | 8.6       | 12.0       | 8              |
| SM Coldwater River 120215                   | 4.9                         | 5.2       | <b>6.3</b>    | 7.2       | 7.6        | 8              |
| SM Huron River (Headwaters) 470521          | 4.9                         | 5.3       | <b>5.9</b>    | 6.5       | 7.8        | 12             |
| SM Grand River (Headwaters) 380083          | 4.2                         | 4.6       | <b>5.9</b>    | 8.2       | 9.4        | 12             |
| NL Paint River 360124                       | 3.0                         | 4.5       | <b>5.6</b>    | 8.5       | 15.0       | 12             |
| HE Johnson Drain 821417                     | 1.9                         | 3.3       | <b>5.1</b>    | 6.7       | 7.1        | 8              |
| SM Shiawassee River (Headwaters) 631036     | 3.8                         | 4.3       | <b>4.8</b>    | 5.0       | 5.3        | 8              |
| SM Pokagon Creek 140110                     | 3.2                         | 3.6       | <b>4.4</b>    | 5.3       | 7.2        | 8              |
| NL Perry Creek 680056                       | 2.7                         | 3.1       | <b>4.4</b>    | 5.1       | 6.5        | 12             |
| SM North Branch Clinton River 500467        | 3.4                         | 3.9       | <b>4.3</b>    | 6.0       | 8.5        | 8              |
| NL Pigeon River 160177                      | 3.3                         | 3.6       | <b>4.3</b>    | 6.1       | 8.0        | 8              |
| SM South Branch Kalamazoo River 130331      | 2.2                         | 3.3       | <b>4.2</b>    | 5.4       | 6.1        | 8              |
| NL Fox River 770082                         | 3.0                         | 3.5       | <b>4.1</b>    | 5.1       | 6.2        | 8              |
| NL Thunder Bay River (Headwaters) 600051    | 3.0                         | 3.7       | <b>4.1</b>    | 4.9       | 5.0        | 8              |
| NL East Creek 280318                        | 1.9                         | 2.6       | <b>3.6</b>    | 6.1       | 15.0       | 12             |
| NL Pere Marquette River (Headwaters) 430578 | 1.9                         | 2.3       | <b>3.6</b>    | 4.0       | 5.6        | 8              |
| NL Bigelow Creek 630291                     | 2.3                         | 2.5       | <b>3.2</b>    | 5.0       | 7.1        | 12             |
| NL West Branch Tittabawassee 260068         | 2.4                         | 2.6       | <b>3.1</b>    | 5.6       | 13.0       | 12             |
| NL Tahquamenon River (Headwaters) 480033    | 1.0                         | 1.4       | <b>1.5</b>    | 1.7       | 2.2        | 8              |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Calcium (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>       | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Huron River 580364                        | 59.1                    | 82.3             | <b>97.5</b>          | 118.0            | 177.0             | 79                    |
| SM Grand River (Upper) 340025                | 45.4                    | 65.2             | <b>75.5</b>          | 80.4             | 91.9              | 79                    |
| HE Black River 740267                        | 33.1                    | 65.0             | <b>75.4</b>          | 82.8             | 101.0             | 48                    |
| SM Kalamazoo River (Upper) 390598            | 25.0                    | 68.3             | <b>75.2</b>          | 80.6             | 88.9              | 79                    |
| HE Cass River 730024                         | NQ                      | 67.1             | <b>74.9</b>          | 84.0             | 109.0             | 79                    |
| HE River Raisin 580046                       | 37.4                    | 59.7             | <b>72.9</b>          | 85.1             | 96.4              | 78                    |
| SM St. Joseph River (Lower) 110628           | NQ                      | 64.9             | <b>68.9</b>          | 73.2             | 80.6              | 92                    |
| HE Clinton River 500233                      | 18.0                    | 56.6             | <b>67.6</b>          | 74.0             | 94.4              | 161                   |
| SM Grand River (Lower) 700123                | 43.3                    | 59.6             | <b>66.6</b>          | 75.6             | 87.5              | 174                   |
| SM St. Joseph River (Upper) 750273           | 21.0                    | 63.2             | <b>66.6</b>          | 70.1             | 78.2              | 73                    |
| HE Shiawassee River 730023                   | 37.7                    | 60.3             | <b>65.7</b>          | 73.6             | 97.7              | 74                    |
| HE Flint River 730285                        | 40.8                    | 57.2             | <b>63.0</b>          | 71.0             | 80.0              | 78                    |
| SM Kalamazoo River (Lower) 030077            | 38.7                    | 56.4             | <b>62.7</b>          | 68.7             | 82.0              | 174                   |
| HE Saginaw River 090177                      | 35.2                    | 56.2             | <b>61.7</b>          | 66.1             | 80.2              | 156                   |
| HE Tittabawassee River 730025                | 43.4                    | 54.3             | <b>59.3</b>          | 62.9             | 75.2              | 79                    |
| NL Thunder Bay River 040123                  | 35.2                    | 42.1             | <b>48.5</b>          | 52.2             | 59.8              | 74                    |
| NC Boardman River 280014                     | 35.7                    | 44.7             | <b>47.2</b>          | 49.0             | 55.2              | 75                    |
| NC Manistee River 510088                     | 34.4                    | 40.7             | <b>43.8</b>          | 45.4             | 52.5              | 71                    |
| SM Muskegon River (Lower) 610273             | 30.7                    | 39.1             | <b>43.2</b>          | 46.0             | 54.0              | 173                   |
| SM Pere Marquette River 530027               | 27.0                    | 38.3             | <b>42.9</b>          | 45.2             | 49.6              | 91                    |
| HE River Rouge 820070                        | 12.3                    | 38.2             | <b>42.8</b>          | 49.4             | 84.1              | 74                    |
| NL Muskegon River (Upper) 670008             | 21.9                    | 33.7             | <b>42.5</b>          | 46.5             | 52.7              | 80                    |
| NL Au Sable River 350061                     | 33.7                    | 38.9             | <b>41.1</b>          | 42.7             | 53.6              | 160                   |
| NL Cheboygan River 160073                    | 34.4                    | 38.7             | <b>40.8</b>          | 42.6             | 54.1              | 74                    |
| NL Sturgeon River 210032                     | 9.9                     | 24.7             | <b>32.2</b>          | 38.1             | 54.9              | 79                    |
| NL Escanaba River 210102                     | 3.9                     | 23.7             | <b>29.0</b>          | 33.2             | 38.4              | 91                    |
| NL Menominee River 550038                    | 11.6                    | 24.6             | <b>27.2</b>          | 29.4             | 33.1              | 87                    |
| NL Manistique River 770073                   | 9.0                     | 22.0             | <b>26.0</b>          | 28.8             | 41.0              | 91                    |
| NL Pine River 490006                         | 9.6                     | 21.9             | <b>25.2</b>          | 29.5             | 36.7              | 70                    |
| NL Tahquamenon River 170141                  | 6.4                     | 15.2             | <b>20.3</b>          | 23.4             | 27.3              | 84                    |
| NL Ontonagon River 660038                    | 9.2                     | 16.5             | <b>20.2</b>          | 22.0             | 25.0              | 71                    |

| <i>Minimally Impacted Sites</i>              | <b>**Calcium (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>       | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 75.0                    | 93.2             | <b>97.6</b>          | 101.0            | 107.0             | 8                     |
| SM North Branch Clinton River 500467         | 68.9                    | 85.5             | <b>89.2</b>          | 92.3             | 97.0              | 8                     |
| SM Bellamy Creek 340186                      | 71.1                    | 75.1             | <b>81.9</b>          | 84.2             | 88.6              | 8                     |
| SM South Branch Kalamazoo River 130331       | 70.9                    | 79.3             | <b>79.7</b>          | 81.4             | 83.8              | 8                     |
| HE Black River (Headwaters) 760058           | 52.8                    | 70.3             | <b>78.0</b>          | 91.9             | 100.0             | 8                     |
| SM South Branch Flint River 440173           | 65.4                    | 68.3             | <b>71.1</b>          | 77.0             | 85.8              | 12                    |
| SM Grand River (Headwaters) 380083           | 50.2                    | 67.7             | <b>70.9</b>          | 73.6             | 77.1              | 12                    |
| SM Shiawassee River (Headwaters) 631036      | 59.9                    | 62.4             | <b>65.5</b>          | 70.7             | 73.8              | 8                     |
| SM Huron River (Headwaters) 470521           | 55.4                    | 59.4             | <b>64.5</b>          | 74.8             | 88.0              | 12                    |
| SM Coldwater River 120215                    | 55.9                    | 58.8             | <b>63.8</b>          | 65.1             | 72.9              | 8                     |
| SM Pokagon Creek 140110                      | 57.8                    | 60.5             | <b>63.4</b>          | 67.8             | 71.5              | 8                     |
| HE Evergreen Creek 790157                    | 53.2                    | 56.9             | <b>61.0</b>          | 65.7             | 68.7              | 12                    |
| NL Anderson Creek 830159                     | 28.9                    | 48.6             | <b>61.0</b>          | 64.3             | 69.1              | 8                     |
| SM River Raisin (Headwaters) 380393          | 55.1                    | 57.3             | <b>58.4</b>          | 61.4             | 66.2              | 12                    |
| NL Perry Creek 680056                        | 49.5                    | 54.0             | <b>56.5</b>          | 59.1             | 60.5              | 12                    |
| NL Pigeon River 160177                       | 52.7                    | 55.0             | <b>56.2</b>          | 57.4             | 59.3              | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 48.9                    | 50.6             | <b>51.5</b>          | 52.9             | 53.8              | 8                     |
| NL West Branch Tittabawassee 260068          | 44.8                    | 47.2             | <b>49.9</b>          | 54.0             | 56.1              | 12                    |
| NL East Creek 280318                         | 36.3                    | 42.3             | <b>48.1</b>          | 50.0             | 54.4              | 12                    |
| NL Bigelow Creek 630291                      | 29.4                    | 38.4             | <b>40.2</b>          | 42.3             | 44.5              | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 36.0                    | 38.9             | <b>39.5</b>          | 40.1             | 40.9              | 8                     |
| NL Bryan Creek 520258                        | 18.9                    | 24.8             | <b>29.5</b>          | 32.0             | 32.9              | 8                     |
| NL Bear Creek 170154                         | 18.8                    | 23.2             | <b>28.9</b>          | 39.0             | 46.6              | 8                     |
| NL Eighteen Mile Creek 210217                | 18.4                    | 21.5             | <b>25.6</b>          | 31.3             | 32.6              | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | 16.7                    | 20.0             | <b>20.6</b>          | 20.8             | 21.4              | 8                     |
| NL Paint River 360124                        | 10.2                    | 17.3             | <b>19.0</b>          | 21.0             | 22.0              | 12                    |
| NL East Branch Ontonagon 310468              | 15.3                    | 16.4             | <b>18.1</b>          | 19.9             | 24.1              | 8                     |
| NL Fox River 770082                          | 10.5                    | 14.1             | <b>15.3</b>          | 16.1             | 16.9              | 8                     |



| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Magnesium (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>          | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Black River 740267                        | 9.5               | 22.7                      | <b>26.5</b>          | 28.9             | 32.0              | 48                    |
| HE Huron River 580364                        | 17.1              | 23.2                      | <b>26.0</b>          | 30.8             | 42.0              | 79                    |
| HE Shiawassee River 730023                   | 12.7              | 23.3                      | <b>24.9</b>          | 26.4             | 37.0              | 74                    |
| HE Cass River 730024                         | 11.7              | 22.4                      | <b>24.2</b>          | 26.0             | 30.4              | 79                    |
| SM Grand River (Upper) 340025                | 12.7              | 20.6                      | <b>23.8</b>          | 25.7             | 29.0              | 79                    |
| HE Flint River 730285                        | 11.3              | 20.6                      | <b>22.5</b>          | 24.3             | 37.1              | 78                    |
| SM St. Joseph River (Lower) 110628           | NQ                | 21.1                      | <b>22.1</b>          | 23.3             | 26.0              | 92                    |
| SM Grand River (Lower) 700123                | 12.6              | 18.8                      | <b>22.0</b>          | 24.5             | 27.0              | 174                   |
| SM Kalamazoo River (Upper) 390598            | 10.4              | 18.3                      | <b>21.9</b>          | 23.6             | 27.0              | 79                    |
| SM Kalamazoo River (Lower) 030077            | 10.3              | 19.0                      | <b>21.5</b>          | 23.1             | 28.0              | 174                   |
| HE River Raisin 580046                       | 10.8              | 16.8                      | <b>20.8</b>          | 23.0             | 27.0              | 78                    |
| SM St. Joseph River (Upper) 750273           | 14.1              | 19.3                      | <b>20.3</b>          | 21.1             | 24.0              | 73                    |
| HE Saginaw River 090177                      | 11.9              | 17.4                      | <b>19.8</b>          | 21.2             | 27.0              | 156                   |
| HE Clinton River 500233                      | 4.0               | 15.3                      | <b>19.8</b>          | 22.2             | 28.0              | 161                   |
| HE Tittabawassee River 730025                | 12.0              | 15.8                      | <b>18.0</b>          | 19.0             | 23.0              | 79                    |
| NL Thunder Bay River 040123                  | 8.4               | 14.0                      | <b>14.5</b>          | 15.0             | 20.5              | 74                    |
| SM Pere Marquette River 530027               | 9.3               | 13.2                      | <b>14.4</b>          | 14.9             | 16.3              | 91                    |
| SM Muskegon River (Lower) 610273             | 9.5               | 12.3                      | <b>13.6</b>          | 14.8             | 18.0              | 173                   |
| NL Cheboygan River 160073                    | 12.2              | 13.0                      | <b>13.3</b>          | 13.6             | 16.6              | 74                    |
| NL Muskegon River (Upper) 670008             | 6.4               | 10.2                      | <b>12.7</b>          | 14.1             | 16.7              | 80                    |
| NL Menominee River 550038                    | 5.1               | 11.1                      | <b>12.4</b>          | 13.7             | 15.0              | 87                    |
| NC Manistee River 510088                     | 9.4               | 11.2                      | <b>12.1</b>          | 12.7             | 14.0              | 71                    |
| NC Boardman River 280014                     | 7.9               | 10.4                      | <b>11.2</b>          | 11.4             | 12.7              | 75                    |
| HE River Rouge 820070                        | 1.0               | 9.8                       | <b>11.0</b>          | 12.4             | 18.7              | 74                    |
| NL Au Sable River 350061                     | 7.9               | 10.2                      | <b>10.9</b>          | 11.2             | 13.0              | 160                   |
| NL Escanaba River 210102                     | 5.7               | 8.9                       | <b>10.5</b>          | 11.3             | 13.5              | 91                    |
| NL Pine River 490006                         | 4.5               | 7.8                       | <b>8.8</b>           | 9.7              | 12.0              | 70                    |
| NL Sturgeon River 210032                     | 2.6               | 5.4                       | <b>6.9</b>           | 8.3              | 10.0              | 79                    |
| NL Manistique River 770073                   | 2.3               | 4.9                       | <b>5.9</b>           | 6.4              | 9.3               | 91                    |
| NL Ontonagon River 660038                    | 1.9               | 4.7                       | <b>5.6</b>           | 6.1              | 11.1              | 71                    |
| NL Tahquamenon River 170141                  | 1.4               | 4.1                       | <b>5.2</b>           | 6.4              | 7.6               | 84                    |

| <i>Minimally Impacted Sites</i>              | <b>**Magnesium (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|---------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>         | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| SM North Branch Clinton River 500467         | 21.3                      | 28.8             | <b>32.0</b>          | 32.8             | 33.2              | 8                     |
| HE Black River (Headwaters) 760058           | 26.5                      | 28.7             | <b>31.0</b>          | 33.0             | 35.0              | 8                     |
| SM Bellamy Creek 340186                      | 24.6                      | 26.2             | <b>27.9</b>          | 29.0             | 29.5              | 8                     |
| SM South Branch Flint River 440173           | 23.0                      | 24.9             | <b>27.5</b>          | 29.5             | 32.1              | 12                    |
| HE Johnson Drain 821417                      | 18.9                      | 22.4             | <b>25.7</b>          | 27.5             | 29.8              | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 22.2                      | 22.7             | <b>25.5</b>          | 25.7             | 27.1              | 8                     |
| SM Pokagon Creek 140110                      | 19.0                      | 23.4             | <b>24.5</b>          | 25.5             | 25.9              | 8                     |
| SM Huron River (Headwaters) 470521           | 18.7                      | 22.0             | <b>23.8</b>          | 24.3             | 27.0              | 12                    |
| SM South Branch Kalamazoo River 130331       | 19.2                      | 22.7             | <b>23.7</b>          | 24.5             | 25.3              | 8                     |
| SM Grand River (Headwaters) 380083           | 15.3                      | 20.4             | <b>23.5</b>          | 24.3             | 26.6              | 12                    |
| HE Evergreen Creek 790157                    | 16.0                      | 18.2             | <b>20.2</b>          | 21.9             | 24.0              | 12                    |
| SM Coldwater River 120215                    | 17.2                      | 19.4             | <b>20.1</b>          | 21.3             | 22.5              | 8                     |
| SM River Raisin (Headwaters) 380393          | 17.3                      | 18.3             | <b>19.5</b>          | 21.2             | 21.8              | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | 14.1                      | 14.5             | <b>15.0</b>          | 15.4             | 15.7              | 8                     |
| NL Pigeon River 160177                       | 13.0                      | 14.3             | <b>15.0</b>          | 15.4             | 15.6              | 8                     |
| NL West Branch Tittabawassee 260068          | 11.9                      | 13.6             | <b>15.0</b>          | 15.1             | 15.1              | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 12.6                      | 13.4             | <b>14.3</b>          | 14.7             | 14.9              | 8                     |
| NL Bigelow Creek 630291                      | 9.6                       | 13.4             | <b>14.1</b>          | 14.7             | 15.6              | 12                    |
| NL Perry Creek 680056                        | 12.0                      | 13.5             | <b>13.9</b>          | 14.1             | 17.0              | 12                    |
| NL Anderson Creek 830159                     | 5.8                       | 9.6              | <b>12.8</b>          | 13.6             | 14.3              | 8                     |
| NL Bryan Creek 520258                        | NQ                        | 9.1              | <b>12.8</b>          | 13.9             | 14.7              | 8                     |
| NL East Creek 280318                         | 8.1                       | 9.9              | <b>11.8</b>          | 12.5             | 13.3              | 12                    |
| NL Bear Creek 170154                         | 6.6                       | 7.4              | <b>10.0</b>          | 12.8             | 15.2              | 8                     |
| NL Eighteen Mile Creek 210217                | 6.0                       | 7.0              | <b>8.5</b>           | 10.3             | 10.8              | 8                     |
| NL Paint River 360124                        | 2.9                       | 5.4              | <b>6.0</b>           | 6.6              | 7.1               | 12                    |
| NL Tahquamenon River (Headwaters) 480033     | 4.9                       | 5.0              | <b>5.0</b>           | 5.1              | 5.2               | 8                     |
| NL East Branch Ontonagon 310468              | 4.3                       | 4.6              | <b>4.9</b>           | 5.2              | 5.7               | 8                     |
| NL Fox River 770082                          | 3.2                       | 4.2              | <b>4.3</b>           | 4.6              | 4.9               | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Potassium (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>          | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE River Rouge 820070                        | 1.2               | 4.6                       | <b>6.4</b>           | 8.0              | 14.7              | 69                    |
| HE Clinton River 500233                      | NQ                | 4.0                       | <b>4.5</b>           | 5.2              | 7.6               | 152                   |
| HE Cass River 730024                         | 2.8               | 3.7                       | <b>4.4</b>           | 5.0              | 6.3               | 75                    |
| HE Flint River 730285                        | 2.8               | 3.7                       | <b>4.2</b>           | 4.9              | 7.7               | 76                    |
| HE Black River 740267                        | 2.0               | 3.4                       | <b>4.0</b>           | 4.8              | 6.6               | 47                    |
| HE Saginaw River 090177                      | 0.5               | 3.4                       | <b>3.9</b>           | 4.4              | 8.1               | 150                   |
| HE Shiawassee River 730023                   | 2.6               | 3.3                       | <b>3.8</b>           | 4.5              | 6.2               | 68                    |
| SM Grand River (Upper) 340025                | 2.6               | 3.2                       | <b>3.6</b>           | 4.1              | 6.7               | 71                    |
| HE River Raisin 580046                       | 2.2               | 2.9                       | <b>3.6</b>           | 4.1              | 5.8               | 76                    |
| HE Huron River 580364                        | 2.8               | 3.1                       | <b>3.3</b>           | 3.8              | 5.1               | 76                    |
| SM Grand River (Lower) 700123                | 2.4               | 3.0                       | <b>3.3</b>           | 3.6              | 29.3              | 147                   |
| HE Tittabawassee River 730025                | 1.1               | 2.4                       | <b>2.8</b>           | 3.3              | 4.9               | 76                    |
| SM Kalamazoo River (Lower) 030077            | 0.8               | 2.5                       | <b>2.7</b>           | 3.0              | 52.5              | 148                   |
| NL Escanaba River 210102                     | 1.1               | 2.0                       | <b>2.7</b>           | 3.8              | 6.2               | 72                    |
| SM St. Joseph River (Lower) 110628           | NQ                | 2.1                       | <b>2.3</b>           | 2.6              | 4.2               | 74                    |
| SM Kalamazoo River (Upper) 390598            | 1.2               | 1.8                       | <b>1.9</b>           | 2.2              | 5.7               | 77                    |
| SM St. Joseph River (Upper) 750273           | 1.5               | 1.7                       | <b>1.8</b>           | 1.8              | 2.8               | 67                    |
| NL Menominee River 550038                    | 0.9               | 1.3                       | <b>1.5</b>           | 1.8              | 4.0               | 84                    |
| NL Ontonagon River 660038                    | 0.8               | 1.1                       | <b>1.2</b>           | 1.7              | 7.1               | 69                    |
| SM Muskegon River (Lower) 610273             | 1.0               | 1.1                       | <b>1.2</b>           | 1.4              | 4.6               | 149                   |
| NL Muskegon River (Upper) 670008             | 0.8               | 1.0                       | <b>1.1</b>           | 1.4              | 61.0              | 74                    |
| NL Pine River 490006                         | 0.5               | 0.9                       | <b>1.0</b>           | 1.5              | 4.8               | 68                    |
| SM Pere Marquette River 530027               | 0.6               | 0.7                       | <b>0.8</b>           | 0.9              | 45.6              | 72                    |
| NL Cheboygan River 160073                    | 0.4               | 0.7                       | <b>0.8</b>           | 0.9              | 9.6               | 68                    |
| NL Thunder Bay River 040123                  | 0.3               | 0.5                       | <b>0.8</b>           | 1.0              | 3.7               | 69                    |
| NC Manistee River 510088                     | NQ                | 0.7                       | <b>0.7</b>           | 0.8              | 23.2              | 70                    |
| NC Boardman River 280014                     | 0.2               | 0.7                       | <b>0.7</b>           | 0.8              | 30.1              | 73                    |
| NL Sturgeon River 210032                     | 0.4               | 0.6                       | <b>0.7</b>           | 0.8              | 1.1               | 75                    |
| NL Tahquamenon River 170141                  | 0.4               | 0.6                       | <b>0.7</b>           | 0.7              | 2.3               | 69                    |
| NL Au Sable River 350061                     | 0.3               | 0.4                       | <b>0.6</b>           | 0.6              | 4.1               | 150                   |
| NL Manistique River 770073                   | 0.4               | 0.5                       | <b>0.6</b>           | 0.7              | 0.9               | 77                    |

| <i>Minimally Impacted Sites</i>              | <b>**Potassium (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|---------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>         | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Black River (Headwaters) 760058           | 3.3                       | 3.7              | <b>4.5</b>           | 6.6              | 8.0               | 8                     |
| HE Johnson Drain 821417                      | 2.8                       | 3.1              | <b>4.3</b>           | 5.1              | 5.6               | 8                     |
| SM Huron River (Headwaters) 470521           | 2.2                       | 2.9              | <b>3.0</b>           | 3.2              | 3.5               | 12                    |
| SM Bellamy Creek 340186                      | 2.1                       | 2.5              | <b>2.9</b>           | 3.2              | 7.2               | 8                     |
| HE Evergreen Creek 790157                    | 2.0                       | 2.2              | <b>2.8</b>           | 3.0              | 4.0               | 10                    |
| SM Coldwater River 120215                    | 1.7                       | 2.1              | <b>2.4</b>           | 2.9              | 3.6               | 8                     |
| SM South Branch Flint River 440173           | 1.3                       | 1.6              | <b>1.9</b>           | 1.9              | 6.7               | 12                    |
| SM North Branch Clinton River 500467         | 1.4                       | 1.6              | <b>1.8</b>           | 2.1              | 2.5               | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 1.0                       | 1.3              | <b>1.6</b>           | 1.6              | 1.9               | 8                     |
| SM River Raisin (Headwaters) 380393          | 1.1                       | 1.4              | <b>1.6</b>           | 1.9              | 2.1               | 12                    |
| NL Perry Creek 680056                        | 1.2                       | 1.3              | <b>1.5</b>           | 1.6              | 2.0               | 12                    |
| SM Pokagon Creek 140110                      | 1.1                       | 1.3              | <b>1.4</b>           | 1.5              | 1.7               | 6                     |
| SM South Branch Kalamazoo River 130331       | 1.0                       | 1.2              | <b>1.3</b>           | 1.8              | 5.0               | 8                     |
| SM Grand River (Headwaters) 380083           | 1.1                       | 1.1              | <b>1.3</b>           | 1.5              | 1.6               | 10                    |
| NL Anderson Creek 830159                     | 0.7                       | 0.9              | <b>1.0</b>           | 1.2              | 1.4               | 8                     |
| NL East Creek 280318                         | 0.7                       | 0.8              | <b>0.9</b>           | 0.9              | 1.1               | 12                    |
| NL Bigelow Creek 630291                      | 0.7                       | 0.8              | <b>0.8</b>           | 0.9              | 1.4               | 10                    |
| NL Bear Creek 170154                         | 0.6                       | 0.7              | <b>0.8</b>           | 0.9              | 1.0               | 8                     |
| NL East Branch Ontonagon 310468              | 0.5                       | 0.6              | <b>0.8</b>           | 0.9              | 1.0               | 8                     |
| NL Fox River 770082                          | 0.6                       | 0.6              | <b>0.7</b>           | 0.7              | 0.7               | 8                     |
| NL Paint River 360124                        | 0.4                       | 0.6              | <b>0.7</b>           | 0.8              | 1.2               | 12                    |
| NL Eighteen Mile Creek 210217                | 0.4                       | 0.6              | <b>0.7</b>           | 0.8              | 0.9               | 8                     |
| NL Pigeon River 160177                       | 0.6                       | 0.7              | <b>0.7</b>           | 0.8              | 1.1               | 8                     |
| NL West Branch Tittabawassee 260068          | 0.6                       | 0.6              | <b>0.7</b>           | 0.9              | 1.4               | 12                    |
| NL Tahquamenon River (Headwaters) 480033     | 0.5                       | 0.6              | <b>0.7</b>           | 0.7              | 0.7               | 8                     |
| NL Bryan Creek 520258                        | 0.5                       | 0.6              | <b>0.7</b>           | 0.9              | 3.0               | 8                     |
| NL Pere Marquette River (Headwaters) 430578  | 0.5                       | 0.6              | <b>0.6</b>           | 0.9              | 13.2              | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 0.5                       | 0.6              | <b>0.6</b>           | 0.7              | 0.8               | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Sodium (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>       | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Clinton River 500233                      | 19.5              | 65.1                   | <b>88.0</b>          | 105.0            | 295.0             | 153                   |
| HE Huron River 580364                        | 34.9              | 46.0                   | <b>50.8</b>          | 58.1             | 103.0             | 76                    |
| HE Tittabawassee River 730025                | 13.8              | 25.4                   | <b>49.0</b>          | 70.0             | 128.3             | 76                    |
| HE Flint River 730285                        | 20.3              | 38.3                   | <b>45.5</b>          | 57.3             | 119.0             | 76                    |
| NL Escanaba River 210102                     | 1.2               | 26.4                   | <b>45.2</b>          | 66.2             | 110.0             | 72                    |
| HE River Rouge 820070                        | 14.2              | 33.3                   | <b>42.6</b>          | 71.6             | 162.0             | 69                    |
| HE Saginaw River 090177                      | 10.7              | 24.9                   | <b>39.5</b>          | 54.7             | 93.1              | 150                   |
| HE Shiawassee River 730023                   | 13.0              | 29.4                   | <b>38.1</b>          | 46.2             | 66.3              | 68                    |
| SM Grand River (Lower) 700123                | 11.2              | 20.8                   | <b>28.0</b>          | 33.6             | 47.0              | 148                   |
| HE Black River 740267                        | 3.9               | 17.3                   | <b>27.0</b>          | 32.5             | 46.0              | 47                    |
| SM Grand River (Upper) 340025                | 11.4              | 19.3                   | <b>25.6</b>          | 32.3             | 46.4              | 71                    |
| SM Kalamazoo River (Lower) 030077            | 4.8               | 18.4                   | <b>23.4</b>          | 27.6             | 37.0              | 149                   |
| HE River Raisin 580046                       | 8.1               | 15.9                   | <b>21.7</b>          | 26.2             | 33.0              | 76                    |
| SM Kalamazoo River (Upper) 390598            | 6.5               | 14.7                   | <b>19.5</b>          | 23.7             | 31.0              | 77                    |
| HE Cass River 730024                         | 5.1               | 14.3                   | <b>18.0</b>          | 25.5             | 141.0             | 75                    |
| SM St. Joseph River (Lower) 110628           | NQ                | 14.2                   | <b>16.3</b>          | 18.9             | 23.0              | 74                    |
| SM Muskegon River (Lower) 610273             | 5.9               | 9.2                    | <b>10.5</b>          | 11.7             | 14.3              | 150                   |
| SM St. Joseph River (Upper) 750273           | 6.9               | 9.5                    | <b>10.4</b>          | 11.1             | 14.0              | 67                    |
| NL Muskegon River (Upper) 670008             | 3.3               | 8.2                    | <b>9.7</b>           | 11.2             | 16.0              | 74                    |
| NL Menominee River 550038                    | 1.8               | 6.4                    | <b>8.9</b>           | 11.3             | 20.7              | 85                    |
| SM Pere Marquette River 530027               | 2.6               | 6.1                    | <b>7.9</b>           | 8.8              | 10.3              | 72                    |
| NC Manistee River 510088                     | NQ                | 6.1                    | <b>7.0</b>           | 7.9              | 9.5               | 70                    |
| NL Thunder Bay River 040123                  | 3.7               | 5.5                    | <b>6.0</b>           | 6.4              | 24.6              | 69                    |
| NL Cheboygan River 160073                    | 3.8               | 5.3                    | <b>5.9</b>           | 6.3              | 7.0               | 68                    |
| NC Boardman River 280014                     | 3.2               | 4.7                    | <b>5.2</b>           | 5.6              | 6.6               | 73                    |
| NL Au Sable River 350061                     | 3.4               | 4.8                    | <b>5.1</b>           | 5.4              | 6.7               | 150                   |
| NL Ontonagon River 660038                    | 1.2               | 2.5                    | <b>3.0</b>           | 3.4              | 4.0               | 69                    |
| NL Pine River 490006                         | NQ                | 1.8                    | <b>2.5</b>           | 3.0              | 7.6               | 68                    |
| NL Tahquamenon River 170141                  | NQ                | 1.6                    | <b>2.0</b>           | 2.3              | 4.6               | 69                    |
| NL Manistique River 770073                   | NQ                | 1.6                    | <b>1.9</b>           | 2.2              | 4.1               | 77                    |
| NL Sturgeon River 210032                     | NQ                | 1.2                    | <b>1.7</b>           | 2.1              | 4.0               | 75                    |

| <i>Minimally Impacted Sites</i>              | <b>**Sodium (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>      | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 41.1                   | 45.8             | <b>71.8</b>          | 147.5            | 195.0             | 8                     |
| SM Huron River (Headwaters) 470521           | 47.2                   | 56.2             | <b>65.7</b>          | 72.0             | 77.0              | 12                    |
| HE Black River (Headwaters) 760058           | 19.5                   | 31.4             | <b>38.5</b>          | 50.3             | 64.0              | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 21.7                   | 22.6             | <b>23.3</b>          | 24.4             | 24.9              | 8                     |
| SM Coldwater River 120215                    | 12.2                   | 13.3             | <b>14.6</b>          | 16.3             | 35.8              | 8                     |
| SM River Raisin (Headwaters) 380393          | 11.0                   | 12.9             | <b>13.4</b>          | 14.0             | 14.8              | 12                    |
| SM South Branch Flint River 440173           | 10.3                   | 12.0             | <b>12.9</b>          | 14.7             | 16.1              | 12                    |
| SM Grand River (Headwaters) 380083           | 6.6                    | 8.6              | <b>9.8</b>           | 10.0             | 10.6              | 10                    |
| SM North Branch Clinton River 500467         | 6.9                    | 8.5              | <b>8.9</b>           | 8.9              | 9.1               | 8                     |
| NL Perry Creek 680056                        | 6.8                    | 8.0              | <b>8.6</b>           | 9.1              | 10.7              | 12                    |
| SM Bellamy Creek 340186                      | 7.7                    | 8.3              | <b>8.5</b>           | 9.3              | 10.9              | 8                     |
| HE Evergreen Creek 790157                    | 6.4                    | 6.9              | <b>7.8</b>           | 8.3              | 9.1               | 10                    |
| SM South Branch Kalamazoo River 130331       | 5.8                    | 7.2              | <b>7.5</b>           | 7.6              | 7.7               | 8                     |
| NL Bigelow Creek 630291                      | 3.8                    | 4.4              | <b>5.5</b>           | 6.2              | 7.3               | 10                    |
| SM Pokagon Creek 140110                      | 4.7                    | 4.9              | <b>5.4</b>           | 5.9              | 5.9               | 6                     |
| NL East Creek 280318                         | 3.7                    | 4.7              | <b>5.3</b>           | 5.9              | 6.2               | 12                    |
| NL Pere Marquette River (Headwaters) 430578  | 4.1                    | 4.9              | <b>5.2</b>           | 5.8              | 7.2               | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 4.8                    | 4.9              | <b>5.1</b>           | 5.6              | 5.6               | 8                     |
| NL West Branch Tittabawassee 260068          | 3.2                    | 3.7              | <b>4.5</b>           | 5.0              | 5.6               | 12                    |
| NL Anderson Creek 830159                     | 3.3                    | 4.1              | <b>4.3</b>           | 4.6              | 4.8               | 8                     |
| NL Pigeon River 160177                       | 3.2                    | 3.5              | <b>4.0</b>           | 4.2              | 4.3               | 8                     |
| NL Paint River 360124                        | 1.3                    | 1.9              | <b>2.1</b>           | 2.4              | 2.9               | 12                    |
| NL East Branch Ontonagon 310468              | 1.5                    | 1.8              | <b>2.1</b>           | 2.5              | 3.7               | 8                     |
| NL Bear Creek 170154                         | NQ                     | 1.0              | <b>1.8</b>           | 2.1              | 2.3               | 8                     |
| NL Eighteen Mile Creek 210217                | 1.2                    | 1.5              | <b>1.7</b>           | 2.3              | 2.5               | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | NQ                     | 0.5              | <b>1.1</b>           | 1.6              | 1.7               | 8                     |
| NL Bryan Creek 520258                        | NQ                     | 1.0              | <b>1.0</b>           | 1.2              | 66.0              | 8                     |
| NL Fox River 770082                          | NQ                     | 0.5              | <b>0.8</b>           | 1.4              | 1.6               | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Chloride (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|--------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>         | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Clinton River 500233                      | 38.0              | 112.0                    | <b>151.0</b>         | 182.0            | 447.0             | 161                   |
| HE Huron River 580364                        | 68.0              | 87.0                     | <b>97.0</b>          | 110.0            | 174.0             | 79                    |
| HE Tittabawassee River 730025                | 25.0              | 48.0                     | <b>85.0</b>          | 120.0            | 204.0             | 79                    |
| HE Flint River 730285                        | 40.5              | 71.9                     | <b>83.0</b>          | 97.0             | 232.0             | 78                    |
| HE River Rouge 820070                        | 23.0              | 66.0                     | <b>80.0</b>          | 120.0            | 259.0             | 74                    |
| HE Shiawassee River 730023                   | 29.0              | 60.0                     | <b>72.0</b>          | 81.0             | 117.0             | 74                    |
| HE Saginaw River 090177                      | 24.0              | 49.7                     | <b>72.0</b>          | 97.5             | 194.0             | 156                   |
| SM Grand River (Lower) 700123                | 22.8              | 40.0                     | <b>51.0</b>          | 60.0             | 79.0              | 174                   |
| HE Black River 740267                        | 14.0              | 42.0                     | <b>51.0</b>          | 58.0             | 82.0              | 48                    |
| SM Grand River (Upper) 340025                | 22.0              | 40.0                     | <b>48.0</b>          | 59.0             | 94.0              | 79                    |
| HE River Raisin 580046                       | 21.0              | 35.0                     | <b>44.2</b>          | 50.2             | 64.0              | 78                    |
| SM Kalamazoo River (Lower) 030077            | 21.0              | 34.0                     | <b>42.0</b>          | 48.0             | 62.0              | 174                   |
| HE Cass River 730024                         | 15.0              | 33.0                     | <b>40.0</b>          | 48.0             | 88.0              | 79                    |
| SM Kalamazoo River (Upper) 390598            | 13.0              | 30.0                     | <b>39.0</b>          | 48.0             | 59.0              | 79                    |
| SM St. Joseph River (Lower) 110628           | ND                | 27.0                     | <b>31.0</b>          | 35.0             | 45.0              | 92                    |
| SM St. Joseph River (Upper) 750273           | 15.0              | 21.0                     | <b>23.1</b>          | 25.0             | 34.0              | 74                    |
| NL Escanaba River 210102                     | 5.0               | 13.0                     | <b>21.0</b>          | 32.0             | 61.0              | 90                    |
| SM Muskegon River (Lower) 610273             | 11.0              | 16.0                     | <b>18.9</b>          | 20.0             | 26.0              | 173                   |
| NL Muskegon River (Upper) 670008             | 2.0               | 14.0                     | <b>16.0</b>          | 19.0             | 72.0              | 80                    |
| SM Pere Marquette River 530027               | 5.0               | 10.0                     | <b>13.0</b>          | 14.0             | 51.0              | 91                    |
| NC Manistee River 510088                     | 7.5               | 10.0                     | <b>12.0</b>          | 13.0             | 33.0              | 71                    |
| NC Boardman River 280014                     | 7.0               | 8.0                      | <b>8.0</b>           | 9.0              | 34.0              | 75                    |
| NL Cheboygan River 160073                    | 6.0               | 8.0                      | <b>8.0</b>           | 9.0              | 16.0              | 74                    |
| NL Menominee River 550038                    | 3.0               | 6.0                      | <b>7.3</b>           | 9.0              | 13.0              | 87                    |
| NL Thunder Bay River 040123                  | 5.0               | 7.0                      | <b>7.0</b>           | 8.0              | 14.0              | 74                    |
| NL Au Sable River 350061                     | 4.9               | 6.0                      | <b>6.0</b>           | 6.1              | 34.0              | 160                   |
| NL Ontonagon River 660038                    | 2.0               | 3.0                      | <b>3.0</b>           | 4.0              | 72.0              | 71                    |
| NL Pine River 490006                         | 1.0               | 2.0                      | <b>3.0</b>           | 4.0              | 12.0              | 71                    |
| NL Sturgeon River 210032                     | 1.9               | 2.0                      | <b>2.0</b>           | 3.0              | 4.0               | 79                    |
| NL Tahquamenon River 170141                  | 1.9               | 2.0                      | <b>2.0</b>           | 3.0              | 4.0               | 84                    |
| NL Manistique River 770073                   | 1.0               | 2.0                      | <b>2.0</b>           | 3.0              | 3.7               | 92                    |

| <i>Minimally Impacted Sites</i>              | <b>**Chloride (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|--------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>        | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 82.0                     | 90.0             | <b>151.0</b>         | 272.5            | 360.0             | 8.0                   |
| SM Huron River (Headwaters) 470521           | 96.0                     | 110.0            | <b>120.0</b>         | 130.0            | 141.0             | 12.0                  |
| HE Black River (Headwaters) 760058           | 50.0                     | 60.0             | <b>75.5</b>          | 90.0             | 100.0             | 8.0                   |
| SM Shiawassee River (Headwaters) 631036      | 47.0                     | 47.0             | <b>50.5</b>          | 52.5             | 55.0              | 8.0                   |
| SM South Branch Flint River 440173           | 27.6                     | 30.3             | <b>34.0</b>          | 35.0             | 37.2              | 12.0                  |
| SM Coldwater River 120215                    | 28.0                     | 28.5             | <b>32.5</b>          | 37.5             | 70.0              | 8.0                   |
| SM Bellamy Creek 340186                      | 24.0                     | 26.5             | <b>28.0</b>          | 30.5             | 32.0              | 8.0                   |
| SM River Raisin (Headwaters) 380393          | 27.0                     | 27.2             | <b>28.0</b>          | 29.0             | 30.0              | 12.0                  |
| SM North Branch Clinton River 500467         | 8.0                      | 21.5             | <b>27.5</b>          | 29.5             | 32.0              | 8.0                   |
| SM South Branch Kalamazoo River 130331       | 21.0                     | 22.5             | <b>25.5</b>          | 27.0             | 30.0              | 8.0                   |
| SM Grand River (Headwaters) 380083           | 17.0                     | 19.5             | <b>23.0</b>          | 24.0             | 25.0              | 12.0                  |
| HE Evergreen Creek 790157                    | 11.0                     | 15.0             | <b>18.0</b>          | 18.5             | 19.0              | 12.0                  |
| NL Perry Creek 680056                        | 8.1                      | 11.0             | <b>13.0</b>          | 15.0             | 24.0              | 12.0                  |
| SM Pokagon Creek 140110                      | 8.0                      | 10.0             | <b>10.0</b>          | 11.0             | 13.0              | 8.0                   |
| NL Anderson Creek 830159                     | 5.0                      | 8.0              | <b>10.0</b>          | 10.5             | 13.0              | 8.0                   |
| NL East Creek 280318                         | 8.0                      | 8.7              | <b>9.0</b>           | 10.0             | 11.0              | 12.0                  |
| NL Bigelow Creek 630291                      | 6.5                      | 8.0              | <b>9.0</b>           | 10.0             | 11.0              | 12.0                  |
| NL Pere Marquette River (Headwaters) 430578  | 6.0                      | 6.0              | <b>7.0</b>           | 7.0              | 18.0              | 8.0                   |
| NL Thunder Bay River (Headwaters) 600051     | 6.0                      | 6.0              | <b>6.0</b>           | 6.0              | 7.0               | 8.0                   |
| NL Pigeon River 160177                       | 4.0                      | 4.0              | <b>5.0</b>           | 5.0              | 6.0               | 8.0                   |
| NL Eighteen Mile Creek 210217                | 2.0                      | 2.4              | <b>2.9</b>           | 3.0              | 3.3               | 8.0                   |
| NL West Branch Tittabawassee 260068          | 1.7                      | 2.0              | <b>2.5</b>           | 3.0              | 4.7               | 12.0                  |
| NL Bear Creek 170154                         | 1.0                      | 1.0              | <b>2.0</b>           | 2.0              | 2.0               | 8.0                   |
| NL Paint River 360124                        | 1.0                      | 1.7              | <b>1.9</b>           | 2.0              | 2.0               | 12.0                  |
| NL East Branch Ontonagon 310468              | NQ                       | 1.0              | <b>1.1</b>           | 2.2              | 2.7               | 8.0                   |
| NL Bryan Creek 520258                        | 1.0                      | 1.0              | <b>1.0</b>           | 1.0              | 2.0               | 8.0                   |
| NL Fox River 770082                          | 1.0                      | 1.0              | <b>1.0</b>           | 1.0              | 1.0               | 7.0                   |
| NL Tahquamenon River (Headwaters) 480033     | 1.0                      | 1.0              | <b>1.0</b>           | 1.0              | 1.0               | 4.0                   |



| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Sulfate (mg/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|-------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>        | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Huron River 580364                        | 26                | 76                      | <b>121</b>           | 194              | 470               | 79                    |
| HE Black River 740267                        | 22                | 49                      | <b>64</b>            | 72               | 88                | 48                    |
| HE Cass River 730024                         | 24                | 42                      | <b>50</b>            | 60               | 101               | 79                    |
| HE River Raisin 580046                       | 19                | 40                      | <b>48</b>            | 62               | 101               | 78                    |
| SM Grand River (Upper) 340025                | 16                | 37                      | <b>43</b>            | 54               | 89                | 79                    |
| SM Grand River (Lower) 700123                | 14                | 33                      | <b>42</b>            | 50               | 63                | 174                   |
| NL Escanaba River 210102                     | 10                | 24                      | <b>40</b>            | 59               | 130               | 91                    |
| SM St. Joseph River (Lower) 110628           | ND                | 34                      | <b>37</b>            | 41               | 50                | 92                    |
| HE Clinton River 500233                      | 10                | 26                      | <b>34</b>            | 39               | 57                | 161                   |
| HE Flint River 730285                        | 18                | 28                      | <b>33</b>            | 41               | 67                | 78                    |
| SM St. Joseph River (Upper) 750273           | 21                | 29                      | <b>33</b>            | 38               | 49                | 74                    |
| HE Tittabawassee River 730025                | 16                | 26                      | <b>32</b>            | 35               | 52                | 79                    |
| SM Kalamazoo River (Lower) 030077            | 14                | 28                      | <b>32</b>            | 37               | 86                | 174                   |
| HE Saginaw River 090177                      | 12                | 28                      | <b>32</b>            | 39               | 54                | 156                   |
| SM Kalamazoo River (Upper) 390598            | 16                | 26                      | <b>32</b>            | 36               | 52                | 79                    |
| HE Shiawassee River 730023                   | 12                | 26                      | <b>31</b>            | 38               | 78                | 74                    |
| NL Sturgeon River 210032                     | 10                | 20                      | <b>27</b>            | 36               | 63                | 79                    |
| HE River Rouge 820070                        | 13                | 23                      | <b>26</b>            | 32               | 59                | 74                    |
| NL Manistique River 770073                   | 4                 | 14                      | <b>17</b>            | 20               | 34                | 92                    |
| NL Menominee River 550038                    | 6                 | 11                      | <b>16</b>            | 19               | 30                | 87                    |
| SM Pere Marquette River 530027               | 6                 | 12                      | <b>14</b>            | 16               | 24                | 91                    |
| SM Muskegon River (Lower) 610273             | 6                 | 10                      | <b>13</b>            | 16               | 24                | 173                   |
| NC Manistee River 510088                     | 4                 | 7                       | <b>9</b>             | 10               | 17                | 71                    |
| NL Tahquamenon River 170141                  | 5                 | 7                       | <b>9</b>             | 11               | 30                | 84                    |
| NL Muskegon River (Upper) 670008             | ND                | 5                       | <b>7</b>             | 10               | 17                | 79                    |
| NL Cheboygan River 160073                    | ND                | 6                       | <b>7</b>             | 8                | 15                | 73                    |
| NC Boardman River 280014                     | ND                | 4                       | <b>6</b>             | 9                | 15                | 75                    |
| NL Pine River 490006                         | 2                 | 4                       | <b>6</b>             | 8                | 21                | 71                    |
| NL Au Sable River 350061                     | ND                | 4                       | <b>6</b>             | 8                | 52                | 159                   |
| NL Thunder Bay River 040123                  | ND                | 4                       | <b>6</b>             | 8                | 18                | 73                    |
| NL Ontonagon River 660038                    | ND                | 2                       | <b>4</b>             | 7                | 50                | 71                    |

| <i>Minimally Impacted Sites</i>              | <b>**Sulfate (mg/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|-------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>       | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Black River (Headwaters) 760058           | 59                      | 72               | <b>78</b>            | 89               | 95                | 7                     |
| HE Johnson Drain 821417                      | 29                      | 35               | <b>38</b>            | 43               | 44                | 8                     |
| SM Coldwater River 120215                    | 23                      | 29               | <b>36</b>            | 39               | 42                | 8                     |
| SM Huron River (Headwaters) 470521           | 28                      | 31               | <b>36</b>            | 41               | 42                | 12                    |
| HE Evergreen Creek 790157                    | 22                      | 29               | <b>34</b>            | 35               | 41                | 12                    |
| SM South Branch Kalamazoo River 130331       | 23                      | 31               | <b>32</b>            | 39               | 52                | 8                     |
| SM Bellamy Creek 340186                      | 22                      | 26               | <b>30</b>            | 39               | 54                | 8                     |
| SM North Branch Clinton River 500467         | 9                       | 18               | <b>29</b>            | 32               | 33                | 8                     |
| SM South Branch Flint River 440173           | 12                      | 21               | <b>26</b>            | 35               | 46                | 12                    |
| SM River Raisin (Headwaters) 380393          | 13                      | 20               | <b>25</b>            | 33               | 41                | 12                    |
| SM Pokagon Creek 140110                      | 15                      | 20               | <b>24</b>            | 32               | 39                | 8                     |
| SM Grand River (Headwaters) 380083           | 12                      | 20               | <b>22</b>            | 26               | 29                | 12                    |
| NL West Branch Tittabawassee 260068          | 4                       | 13               | <b>16</b>            | 19               | 25                | 12                    |
| NL Bigelow Creek 630291                      | 10                      | 12               | <b>12</b>            | 15               | 20                | 12                    |
| NL Anderson Creek 830159                     | 6                       | 7                | <b>11</b>            | 12               | 12                | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 3                       | 6                | <b>10</b>            | 13               | 15                | 8                     |
| NL Eighteen Mile Creek 210217                | 4                       | 5                | <b>10</b>            | 12               | 14                | 8                     |
| NL Perry Creek 680056                        | 2                       | 6                | <b>9</b>             | 12               | 52                | 12                    |
| NL East Creek 280318                         | 4                       | 6                | <b>8</b>             | 11               | 12                | 12                    |
| NL Bear Creek 170154                         | 2                       | 7                | <b>8</b>             | 10               | 12                | 8                     |
| NL Bryan Creek 520258                        | 3                       | 5                | <b>8</b>             | 14               | 17                | 8                     |
| NL Pere Marquette River (Headwaters) 430578  | 5                       | 6                | <b>6</b>             | 8                | 10                | 8                     |
| NL Paint River 360124                        | 3                       | 4                | <b>6</b>             | 8                | 9                 | 12                    |
| NL East Branch Ontonagon 310468              | 2                       | 5                | <b>6</b>             | 7                | 16                | 8                     |
| NL Pigeon River 160177                       | 3                       | 3                | <b>4</b>             | 6                | 8                 | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | 2                       | 3                | <b>4</b>             | 4                | 5                 | 8                     |
| NL Thunder Bay River (Headwaters) 600051     | 2                       | 3                | <b>4</b>             | 5                | 8                 | 8                     |
| NL Fox River 770082                          | 2                       | 2                | <b>3</b>             | 4                | 5                 | 8                     |

| <i>Intensive &amp; Integrator Sites</i>      | <b>**Lead (total) (ug/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>            | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE River Rouge 820070                        | 0.112                        | 1.460            | <b>2.060</b>         | 3.070            | 7.090             | 75                    |
| HE Clinton River 500233                      | 0.377                        | 1.100            | <b>1.655</b>         | 3.060            | 21.100            | 162                   |
| HE Flint River 730285                        | 0.311                        | 0.938            | <b>1.470</b>         | 2.750            | 16.900            | 79                    |
| HE Huron River 580364                        | 0.363                        | 0.996            | <b>1.435</b>         | 1.890            | 2.840             | 80                    |
| SM Kalamazoo River (Lower) 030077            | 0.387                        | 0.946            | <b>1.190</b>         | 1.550            | 7.870             | 162                   |
| SM Grand River (Lower) 700123                | 0.187                        | 0.614            | <b>1.020</b>         | 1.700            | 5.530             | 173                   |
| SM Kalamazoo River (Upper) 390598            | 0.220                        | 0.619            | <b>0.984</b>         | 1.540            | 7.010             | 78                    |
| HE Saginaw River 090177                      | 0.359                        | 0.667            | <b>0.952</b>         | 1.270            | 8.870             | 155                   |
| SM Grand River (Upper) 340025                | 0.255                        | 0.512            | <b>0.796</b>         | 1.165            | 18.000            | 80                    |
| SM St. Joseph River (Lower) 110628           | 0.183                        | 0.497            | <b>0.709</b>         | 1.170            | 5.200             | 91                    |
| HE Cass River 730024                         | 0.175                        | 0.438            | <b>0.608</b>         | 0.882            | 3.320             | 77                    |
| HE River Raisin 580046                       | 0.266                        | 0.400            | <b>0.566</b>         | 0.839            | 8.370             | 77                    |
| HE Black River 740267                        | 0.169                        | 0.406            | <b>0.549</b>         | 0.699            | 12.800            | 48                    |
| HE Shiawassee River 730023                   | 0.108                        | 0.359            | <b>0.546</b>         | 0.770            | 3.910             | 74                    |
| NL Pine River 490006                         | 0.201                        | 0.388            | <b>0.516</b>         | 0.899            | 4.170             | 70                    |
| HE Tittabawassee River 730025                | 0.102                        | 0.228            | <b>0.363</b>         | 0.752            | 2.530             | 79                    |
| SM Pere Marquette River 530027               | 0.051                        | 0.166            | <b>0.290</b>         | 0.390            | 1.470             | 87                    |
| SM St. Joseph River (Upper) 750273           | ND                           | 0.215            | <b>0.264</b>         | 0.346            | 1.400             | 74                    |
| NL Ontonagon River 660038                    | 0.061                        | 0.139            | <b>0.237</b>         | 0.526            | 16.900            | 69                    |
| NL Muskegon River (Upper) 670008             | 0.053                        | 0.137            | <b>0.194</b>         | 0.331            | 3.350             | 78                    |
| NL Tahquamenon River 170141                  | 0.031                        | 0.097            | <b>0.191</b>         | 0.288            | 0.583             | 83                    |
| NL Sturgeon River 210032                     | 0.020                        | 0.073            | <b>0.167</b>         | 0.281            | 0.552             | 78                    |
| NC Manistee River 510088                     | 0.072                        | 0.124            | <b>0.164</b>         | 0.207            | 0.700             | 69                    |
| NL Escanaba River 210102                     | 0.100                        | 0.130            | <b>0.159</b>         | 0.195            | 0.765             | 89                    |
| NL Manistique River 770073                   | 0.046                        | 0.090            | <b>0.156</b>         | 0.214            | 0.407             | 92                    |
| SM Muskegon River (Lower) 610273             | 0.041                        | 0.103            | <b>0.148</b>         | 0.224            | 8.340             | 171                   |
| NL Menominee River 550038                    | ND                           | 0.098            | <b>0.125</b>         | 0.174            | 0.871             | 85                    |
| NL Thunder Bay River 040123                  | 0.040                        | 0.068            | <b>0.084</b>         | 0.109            | 0.251             | 72                    |
| NC Boardman River 280014                     | 0.018                        | 0.045            | <b>0.078</b>         | 0.145            | 1.480             | 74                    |
| NL Cheboygan River 160073                    | NQ                           | 0.029            | <b>0.038</b>         | 0.050            | 0.408             | 71                    |
| NL Au Sable River 350061                     | 0.015                        | 0.029            | <b>0.037</b>         | 0.049            | 0.199             | 159                   |

| <i>Minimally Impacted Sites</i>              | <b>**Lead (total) (ug/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>            | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 0.158                        | 0.234            | <b>1.040</b>         | 1.140            | 2.500             | 7                     |
| SM Grand River (Headwaters) 380083           | 0.066                        | 0.138            | <b>0.376</b>         | 0.745            | 0.857             | 12                    |
| SM Pokagon Creek 140110                      | 0.165                        | 0.300            | <b>0.373</b>         | 0.685            | 2.210             | 8                     |
| HE Black River (Headwaters) 760058           | 0.182                        | 0.243            | <b>0.308</b>         | 0.427            | 0.478             | 8                     |
| SM South Branch Kalamazoo River 130331       | 0.073                        | 0.122            | <b>0.293</b>         | 0.480            | 0.565             | 8                     |
| SM Huron River (Headwaters) 470521           | 0.080                        | 0.156            | <b>0.291</b>         | 0.373            | 0.482             | 12                    |
| NL Bigelow Creek 630291                      | 0.068                        | 0.131            | <b>0.261</b>         | 0.345            | 1.350             | 10                    |
| NL Bear Creek 170154                         | 0.119                        | 0.133            | <b>0.222</b>         | 0.385            | 0.577             | 8                     |
| NL Pere Marquette River (Headwaters) 430578  | 0.042                        | 0.085            | <b>0.173</b>         | 0.203            | 0.256             | 8                     |
| HE Evergreen Creek 790157                    | 0.101                        | 0.119            | <b>0.146</b>         | 0.206            | 0.954             | 12                    |
| SM South Branch Flint River 440173           | ND                           | 0.079            | <b>0.130</b>         | 0.146            | 0.362             | 13                    |
| SM Coldwater River 120215                    | 0.037                        | 0.077            | <b>0.119</b>         | 0.152            | 0.221             | 8                     |
| SM River Raisin (Headwaters) 380393          | 0.031                        | 0.074            | <b>0.119</b>         | 0.195            | 0.311             | 12                    |
| NL Anderson Creek 830159                     | 0.050                        | 0.091            | <b>0.117</b>         | 0.142            | 0.339             | 8                     |
| SM Bellamy Creek 340186                      | 0.027                        | 0.060            | <b>0.107</b>         | 0.117            | 0.128             | 8                     |
| SM North Branch Clinton River 500467         | 0.050                        | 0.070            | <b>0.107</b>         | 0.189            | 0.378             | 8                     |
| NL West Branch Tittabawassee 260068          | 0.054                        | 0.071            | <b>0.102</b>         | 0.233            | 0.716             | 11                    |
| NL Eighteen Mile Creek 210217                | 0.021                        | 0.028            | <b>0.095</b>         | 0.272            | 0.549             | 7                     |
| NL Fox River 770082                          | 0.057                        | 0.080            | <b>0.092</b>         | 0.119            | 0.156             | 8                     |
| NL East Creek 280318                         | 0.020                        | 0.055            | <b>0.078</b>         | 0.106            | 0.435             | 12                    |
| NL Perry Creek 680056                        | 0.032                        | 0.047            | <b>0.068</b>         | 0.110            | 0.135             | 11                    |
| NL Pigeon River 160177                       | 0.020                        | 0.031            | <b>0.066</b>         | 0.073            | 0.175             | 8                     |
| NL Bryan Creek 520258                        | 0.015                        | 0.019            | <b>0.063</b>         | 0.115            | 0.216             | 8                     |
| NL East Branch Ontonagon 310468              | 0.018                        | 0.036            | <b>0.054</b>         | 0.100            | 0.534             | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | 0.023                        | 0.032            | <b>0.045</b>         | 0.065            | 0.075             | 8                     |
| NL Paint River 360124                        | 0.034                        | 0.037            | <b>0.044</b>         | 0.059            | 0.134             | 11                    |
| NL Thunder Bay River (Headwaters) 600051     | 0.021                        | 0.033            | <b>0.044</b>         | 0.047            | 0.187             | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 0.022                        | 0.024            | <b>0.033</b>         | 0.042            | 0.833             | 8                     |

| <i>Intensive &amp; Integrator Sites</i> |            | <b>**Chromium (total) (ug/L)</b> |               |           |            |                |
|-----------------------------------------|------------|----------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>   | <u>Min</u> | <u>Q1</u>                        | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| HE Clinton River 500233                 | 0.275      | 1.040                            | <b>1.540</b>  | 2.740     | 14.700     | 156            |
| HE River Rouge 820070                   | 0.563      | 0.961                            | <b>1.430</b>  | 2.280     | 4.380      | 72             |
| NL Pine River 490006                    | 0.543      | 1.080                            | <b>1.410</b>  | 1.760     | 8.080      | 69             |
| HE Flint River 730285                   | 0.358      | 0.927                            | <b>1.260</b>  | 2.030     | 10.000     | 78             |
| NL Ontonagon River 660038               | 0.331      | 0.854                            | <b>1.150</b>  | 2.270     | 47.700     | 68             |
| SM Grand River (Lower) 700123           | NQ         | 0.629                            | <b>1.115</b>  | 1.685     | 4.730      | 170            |
| SM Kalamazoo River (Upper) 390598       | NQ         | 0.637                            | <b>1.110</b>  | 1.725     | 6.100      | 76             |
| HE Saginaw River 090177                 | NQ         | 0.720                            | <b>0.974</b>  | 1.400     | 7.300      | 148            |
| HE Cass River 730024                    | NQ         | 0.600                            | <b>0.932</b>  | 1.350     | 4.050      | 75             |
| HE Black River 740267                   | 0.292      | 0.716                            | <b>0.953</b>  | 1.250     | 10.200     | 47             |
| SM Grand River (Upper) 340025           | NQ         | 0.526                            | <b>0.764</b>  | 1.190     | 15.100     | 75             |
| HE River Raisin 580046                  | NQ         | 0.476                            | <b>0.739</b>  | 1.280     | 6.750      | 76             |
| SM Kalamazoo River (Lower) 030077       | ND         | 0.503                            | <b>0.704</b>  | 1.009     | 5.970      | 157            |
| HE Shiawassee River 730023              | NQ         | 0.401                            | <b>0.685</b>  | 1.040     | 3.280      | 69             |
| NL Escanaba River 210102                | NQ         | 0.457                            | <b>0.661</b>  | 0.847     | 2.220      | 88             |
| SM St. Joseph River (Lower) 110628      | ND         | 0.300                            | <b>0.640</b>  | 0.980     | 2.680      | 82             |
| HE Huron River 580364                   | NQ         | 0.401                            | <b>0.556</b>  | 0.941     | 2.330      | 77             |
| HE Tittabawassee River 730025           | NQ         | 0.332                            | <b>0.537</b>  | 0.952     | 3.370      | 76             |
| NL Sturgeon River 210032                | NQ         | 0.310                            | <b>0.451</b>  | 0.559     | 1.230      | 73             |
| SM Pere Marquette River 530027          | ND         | 0.273                            | <b>0.433</b>  | 0.625     | 2.490      | 86             |
| NL Tahquamenon River 170141             | ND         | 0.287                            | <b>0.424</b>  | 0.577     | 1.260      | 83             |
| NL Manistique River 770073              | NQ         | 0.302                            | <b>0.420</b>  | 0.575     | 1.180      | 88             |
| NL Menominee River 550038               | ND         | 0.268                            | <b>0.410</b>  | 0.594     | 1.510      | 86             |
| NL Muskegon River (Upper) 670008        | ND         | 0.209                            | <b>0.350</b>  | 0.582     | 2.840      | 75             |
| NC Manistee River 510088                | ND         | 0.210                            | <b>0.300</b>  | 0.515     | 1.140      | 68             |
| SM Muskegon River (Lower) 610273        | ND         | 0.120                            | <b>0.281</b>  | 0.541     | 7.140      | 167            |
| NC Boardman River 280014                | ND         | 0.080                            | <b>0.231</b>  | 0.432     | 1.760      | 74             |
| SM St. Joseph River (Upper) 750273      | ND         | 0.080                            | <b>0.190</b>  | 0.470     | 1.890      | 68             |
| NL Cheboygan River 160073               | ND         | 0.039                            | <b>0.110</b>  | 0.242     | 1.090      | 71             |
| NL Thunder Bay River 040123             | ND         | 0.039                            | <b>0.090</b>  | 0.289     | 1.600      | 70             |
| NL Au Sable River 350061                | ND         | 0.010                            | <b>0.080</b>  | 0.259     | 1.200      | 154            |

| <i>Minimally Impacted Sites</i>             |            | <b>**Chromium (total) (ug/L)</b> |               |           |            |                |
|---------------------------------------------|------------|----------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>       | <u>Min</u> | <u>Q1</u>                        | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| NL Perry Creek 680056                       | 0.350      | 0.756                            | <b>2.160</b>  | 3.585     | 4.260      | 12             |
| NL Paint River 360124                       | 0.496      | 0.651                            | <b>0.874</b>  | 1.105     | 1.180      | 12             |
| HE Johnson Drain 821417                     | NQ         | 0.367                            | <b>0.857</b>  | 1.390     | 1.730      | 6              |
| NL East Branch Ontonagon 310468             | 0.693      | 0.795                            | <b>0.833</b>  | 1.011     | 2.220      | 8              |
| HE Black River (Headwaters) 760058          | 0.389      | 0.418                            | <b>0.602</b>  | 0.731     | 0.953      | 8              |
| NL Bear Creek 170154                        | 0.234      | 0.325                            | <b>0.502</b>  | 1.020     | 1.160      | 7              |
| NL West Branch Tittabawassee 260068         | ND         | 0.120                            | <b>0.372</b>  | 0.659     | 1.210      | 12             |
| NL Eighteen Mile Creek 210217               | 0.208      | 0.217                            | <b>0.357</b>  | 0.669     | 0.851      | 8              |
| SM Huron River (Headwaters) 470521          | ND         | 0.120                            | <b>0.326</b>  | 0.467     | 0.776      | 12             |
| SM Pokagon Creek 140110                     | ND         | 0.039                            | <b>0.320</b>  | 0.400     | 0.450      | 5              |
| NL Tahquamenon River (Headwaters) 480033    | NQ         | 0.224                            | <b>0.276</b>  | 0.397     | 0.570      | 8              |
| NL Bryan Creek 520258                       | NQ         | 0.120                            | <b>0.265</b>  | 0.555     | 0.805      | 8              |
| NL East Creek 280318                        | ND         | 0.120                            | <b>0.263</b>  | 0.316     | 0.908      | 12             |
| SM South Branch Flint River 440173          | ND         | 0.020                            | <b>0.262</b>  | 0.476     | 2.380      | 13             |
| SM Bellamy Creek 340186                     | ND         | 0.120                            | <b>0.246</b>  | 0.731     | 0.772      | 6              |
| NL Bigelow Creek 630291                     | 0.080      | 0.180                            | <b>0.245</b>  | 0.431     | 0.946      | 11             |
| NL Fox River 770082                         | 0.192      | 0.206                            | <b>0.239</b>  | 0.376     | 0.455      | 8              |
| SM South Branch Kalamazoo River 130331      | ND         | 0.120                            | <b>0.235</b>  | 0.327     | 0.585      | 7              |
| HE Evergreen Creek 790157                   | ND         | 0.070                            | <b>0.223</b>  | 0.371     | 1.040      | 11             |
| NL Pere Marquette River (Headwaters) 430578 | ND         | 0.020                            | <b>0.218</b>  | 0.532     | 0.916      | 7              |
| NL Anderson Creek 830159                    | NQ         | 0.120                            | <b>0.202</b>  | 0.271     | 0.402      | 7              |
| SM River Raisin (Headwaters) 380393         | ND         | 0.070                            | <b>0.186</b>  | 0.442     | 1.450      | 12             |
| SM Coldwater River 120215                   | ND         | 0.120                            | <b>0.179</b>  | 0.366     | 1.910      | 8              |
| NL Pigeon River 160177                      | ND         | 0.020                            | <b>0.120</b>  | 0.542     | 0.868      | 7              |
| NL Thunder Bay River (Headwaters) 600051    | ND         | 0.020                            | <b>0.120</b>  | 0.388     | 0.610      | 7              |
| SM North Branch Clinton River 500467        | ND         | 0.120                            | <b>0.120</b>  | 0.448     | 0.888      | 8              |
| SM Grand River (Headwaters) 380083          | NQ         | 0.080                            | <b>0.080</b>  | 0.361     | 0.596      | 11             |
| SM Shiawassee River (Headwaters) 631036     | ND         | 0.020                            | <b>0.020</b>  | 0.392     | 0.598      | 7              |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Copper (total) (ug/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|--------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>               | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Clinton River 500233                      | 1.82              | 2.88                           | <b>3.67</b>          | 4.98             | 19.80             | 159                   |
| NL Ontonagon River 660038                    | 1.12              | 2.14                           | <b>3.27</b>          | 4.27             | 46.90             | 69                    |
| HE River Rouge 820070                        | 0.79              | 2.25                           | <b>2.78</b>          | 3.71             | 7.21              | 74                    |
| HE Flint River 730285                        | 1.41              | 2.29                           | <b>2.58</b>          | 3.16             | 13.50             | 77                    |
| HE River Raisin 580046                       | 1.47              | 1.94                           | <b>2.39</b>          | 3.12             | 5.55              | 78                    |
| SM Grand River (Upper) 340025                | 1.24              | 1.95                           | <b>2.37</b>          | 2.92             | 12.40             | 77                    |
| SM Grand River (Lower) 700123                | 1.13              | 1.66                           | <b>2.34</b>          | 2.87             | 5.46              | 167                   |
| HE Saginaw River 090177                      | 1.45              | 1.92                           | <b>2.15</b>          | 2.52             | 8.14              | 149                   |
| HE Black River 740267                        | 0.67              | 1.66                           | <b>2.10</b>          | 2.66             | 9.40              | 48                    |
| HE Cass River 730024                         | 1.15              | 1.58                           | <b>1.91</b>          | 2.27             | 3.93              | 78                    |
| HE Tittabawassee River 730025                | 1.00              | 1.55                           | <b>1.78</b>          | 2.14             | 5.52              | 78                    |
| HE Shiawassee River 730023                   | 1.05              | 1.40                           | <b>1.70</b>          | 2.05             | 4.28              | 72                    |
| HE Huron River 580364                        | 0.90              | 1.38                           | <b>1.63</b>          | 1.98             | 3.63              | 79                    |
| SM St. Joseph River (Lower) 110628           | 0.87              | 1.31                           | <b>1.52</b>          | 1.83             | 4.92              | 87                    |
| SM Kalamazoo River (Lower) 030077            | 0.81              | 1.23                           | <b>1.42</b>          | 1.71             | 5.03              | 156                   |
| SM Kalamazoo River (Upper) 390598            | 0.62              | 1.03                           | <b>1.38</b>          | 1.64             | 4.25              | 75                    |
| NL Pine River 490006                         | 0.58              | 1.09                           | <b>1.26</b>          | 1.71             | 6.12              | 68                    |
| NL Menominee River 550038                    | ND                | 0.72                           | <b>0.82</b>          | 0.99             | 1.64              | 87                    |
| NL Escanaba River 210102                     | 0.45              | 0.57                           | <b>0.69</b>          | 0.87             | 2.33              | 90                    |
| SM Muskegon River (Lower) 610273             | 0.18              | 0.55                           | <b>0.68</b>          | 0.82             | 6.67              | 163                   |
| SM St. Joseph River (Upper) 750273           | ND                | 0.58                           | <b>0.67</b>          | 0.78             | 1.41              | 71                    |
| NL Muskegon River (Upper) 670008             | 0.34              | 0.48                           | <b>0.62</b>          | 0.80             | 2.80              | 76                    |
| NL Cheboygan River 160073                    | ND                | 0.48                           | <b>0.52</b>          | 0.58             | 0.97              | 71                    |
| SM Pere Marquette River 530027               | 0.18              | 0.42                           | <b>0.49</b>          | 0.60             | 2.05              | 90                    |
| NC Manistee River 510088                     | 0.22              | 0.37                           | <b>0.46</b>          | 0.53             | 0.80              | 69                    |
| NL Sturgeon River 210032                     | 0.21              | 0.33                           | <b>0.42</b>          | 0.51             | 1.57              | 74                    |
| NL Tahquamenon River 170141                  | 0.18              | 0.30                           | <b>0.41</b>          | 0.52             | 0.98              | 82                    |
| NL Thunder Bay River 040123                  | ND                | 0.31                           | <b>0.39</b>          | 0.48             | 0.83              | 70                    |
| NL Manistique River 770073                   | NQ                | 0.31                           | <b>0.37</b>          | 0.43             | 0.68              | 91                    |
| NC Boardman River 280014                     | 0.12              | 0.26                           | <b>0.32</b>          | 0.41             | 1.51              | 71                    |
| NL Au Sable River 350061                     | 0.11              | 0.21                           | <b>0.25</b>          | 0.32             | 1.23              | 152                   |

| <i>Minimally Impacted Sites</i>              | <b>**Copper (total) (ug/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|--------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>              | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 0.74                           | 1.19             | <b>1.87</b>          | 2.66             | 10.30             | 7                     |
| SM North Branch Clinton River 500467         | 1.06                           | 1.19             | <b>1.64</b>          | 3.21             | 3.61              | 8                     |
| HE Black River (Headwaters) 760058           | 0.96                           | 1.12             | <b>1.63</b>          | 2.15             | 2.85              | 8                     |
| SM Bellamy Creek 340186                      | 0.54                           | 0.97             | <b>1.20</b>          | 1.58             | 2.53              | 8                     |
| SM Coldwater River 120215                    | 0.72                           | 0.77             | <b>1.08</b>          | 1.28             | 2.99              | 8                     |
| SM Huron River (Headwaters) 470521           | 0.69                           | 0.80             | <b>0.91</b>          | 1.00             | 1.28              | 12                    |
| NL Bear Creek 170154                         | 0.36                           | 0.48             | <b>0.86</b>          | 0.94             | 1.08              | 7                     |
| HE Evergreen Creek 790157                    | 0.56                           | 0.65             | <b>0.77</b>          | 1.06             | 1.68              | 12                    |
| SM Pokagon Creek 140110                      | 0.21                           | 0.53             | <b>0.70</b>          | 0.83             | 1.51              | 8                     |
| NL East Branch Ontonagon 310468              | 0.38                           | 0.49             | <b>0.66</b>          | 1.01             | 2.79              | 8                     |
| SM Grand River (Headwaters) 380083           | 0.29                           | 0.54             | <b>0.64</b>          | 0.85             | 0.97              | 12                    |
| SM South Branch Flint River 440173           | ND                             | 0.45             | <b>0.57</b>          | 0.79             | 1.03              | 11                    |
| NL Perry Creek 680056                        | 0.35                           | 0.42             | <b>0.51</b>          | 0.61             | 2.38              | 12                    |
| SM River Raisin (Headwaters) 380393          | 0.26                           | 0.31             | <b>0.50</b>          | 0.61             | 0.77              | 11                    |
| SM South Branch Kalamazoo River 130331       | 0.21                           | 0.38             | <b>0.47</b>          | 0.58             | 0.80              | 8                     |
| SM Shiawassee River (Headwaters) 631036      | 0.29                           | 0.32             | <b>0.46</b>          | 0.60             | 1.26              | 8                     |
| NL Anderson Creek 830159                     | 0.22                           | 0.28             | <b>0.45</b>          | 0.51             | 0.58              | 8                     |
| NL West Branch Tittabawassee 260068          | 0.24                           | 0.30             | <b>0.43</b>          | 0.59             | 1.33              | 12                    |
| NL Eighteen Mile Creek 210217                | 0.29                           | 0.32             | <b>0.39</b>          | 0.57             | 1.14              | 8                     |
| NL Paint River 360124                        | 0.27                           | 0.33             | <b>0.38</b>          | 0.58             | 1.12              | 12                    |
| NL Pigeon River 160177                       | 0.34                           | 0.34             | <b>0.37</b>          | 0.47             | 0.80              | 8                     |
| NL East Creek 280318                         | 0.13                           | 0.28             | <b>0.35</b>          | 0.55             | 1.04              | 11                    |
| NL Pere Marquette River (Headwaters) 430578  | 0.26                           | 0.29             | <b>0.34</b>          | 0.39             | 0.40              | 8                     |
| NL Bigelow Creek 630291                      | 0.11                           | 0.25             | <b>0.32</b>          | 0.41             | 0.83              | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | 0.21                           | 0.25             | <b>0.28</b>          | 0.33             | 0.37              | 8                     |
| NL Bryan Creek 520258                        | 0.19                           | 0.23             | <b>0.27</b>          | 0.38             | 0.78              | 7                     |
| NL Tahquamenon River (Headwaters) 480033     | 0.14                           | 0.15             | <b>0.24</b>          | 0.30             | 0.36              | 7                     |
| NL Fox River 770082                          | 0.15                           | 0.16             | <b>0.20</b>          | 0.25             | 0.32              | 7                     |



| <i>Intensive &amp; Integrator Sites</i> |            | <b>**Mercury (total) (ng/L)</b> |               |           |            |                |
|-----------------------------------------|------------|---------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>   | <u>Min</u> | <u>Q1</u>                       | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| SM Kalamazoo River (Lower) 030077       | 1.09       | 3.93                            | <b>5.21</b>   | 7.14      | 15.14      | 158            |
| SM Kalamazoo River (Upper) 390598       | 0.98       | 2.41                            | <b>4.23</b>   | 5.95      | 28.18      | 75             |
| NL Pine River 490006                    | NQ         | 1.92                            | <b>4.14</b>   | 6.37      | 17.76      | 68             |
| NL Tahquamenon River 170141             | 0.63       | 1.76                            | <b>3.99</b>   | 6.45      | 9.63       | 82             |
| HE Clinton River 500233                 | 0.68       | 1.94                            | <b>3.64</b>   | 7.33      | 40.69      | 155            |
| SM Grand River (Lower) 700123           | 0.66       | 1.81                            | <b>3.56</b>   | 5.54      | 21.81      | 169            |
| HE River Rouge 820070                   | NQ         | 2.37                            | <b>3.30</b>   | 6.19      | 15.20      | 73             |
| HE Flint River 730285                   | 0.76       | 2.01                            | <b>3.16</b>   | 5.69      | 29.71      | 77             |
| SM St. Joseph River (Lower) 110628      | 0.79       | 1.85                            | <b>3.04</b>   | 5.03      | 15.98      | 88             |
| SM Grand River (Upper) 340025           | 0.58       | 1.75                            | <b>2.76</b>   | 3.60      | 52.23      | 77             |
| NL Escanaba River 210102                | ND         | 2.04                            | <b>2.76</b>   | 4.02      | 55.36      | 88             |
| NL Sturgeon River 210032                | 0.69       | 1.51                            | <b>2.68</b>   | 5.12      | 9.68       | 76             |
| NL Ontonagon River 660038               | ND         | 1.38                            | <b>2.54</b>   | 5.41      | 45.05      | 68             |
| NL Menominee River 550038               | ND         | 1.88                            | <b>2.47</b>   | 4.19      | 12.10      | 86             |
| NL Manistique River 770073              | 0.49       | 1.33                            | <b>2.24</b>   | 3.83      | 8.24       | 89             |
| HE Saginaw River 090177                 | NQ         | 1.45                            | <b>2.18</b>   | 3.70      | 22.77      | 142            |
| HE Cass River 730024                    | 1.00       | 1.60                            | <b>2.05</b>   | 2.92      | 12.45      | 76             |
| HE Shiawassee River 730023              | 0.59       | 1.25                            | <b>1.90</b>   | 2.87      | 12.53      | 72             |
| SM Pere Marquette River 530027          | 0.46       | 1.38                            | <b>1.90</b>   | 2.90      | 7.07       | 90             |
| HE Tittabawassee River 730025           | 0.48       | 1.05                            | <b>1.82</b>   | 3.33      | 8.01       | 76             |
| HE River Raisin 580046                  | 0.94       | 1.37                            | <b>1.81</b>   | 3.01      | 21.60      | 78             |
| NL Muskegon River (Upper) 670008        | 0.57       | 1.02                            | <b>1.71</b>   | 3.02      | 19.33      | 78             |
| HE Black River 740267                   | 0.55       | 1.18                            | <b>1.64</b>   | 2.55      | 32.64      | 48             |
| HE Huron River 580364                   | NQ         | 1.09                            | <b>1.61</b>   | 2.23      | 5.73       | 80             |
| SM St. Joseph River (Upper) 750273      | ND         | 1.08                            | <b>1.36</b>   | 1.75      | 7.89       | 72             |
| SM Muskegon River (Lower) 610273        | NQ         | 0.71                            | <b>1.10</b>   | 1.68      | 34.00      | 167            |
| NC Manistee River 510088                | NQ         | 0.66                            | <b>0.95</b>   | 1.31      | 3.39       | 69             |
| NC Boardman River 280014                | ND         | 0.51                            | <b>0.82</b>   | 1.37      | 9.34       | 75             |
| NL Thunder Bay River 040123             | NQ         | 0.45                            | <b>0.62</b>   | 1.00      | 2.58       | 68             |
| NL Cheboygan River 160073               | ND         | 0.22                            | <b>0.45</b>   | 0.55      | 1.43       | 72             |
| NL Au Sable River 350061                | ND         | 0.22                            | <b>0.45</b>   | 0.54      | 2.54       | 161            |

| <i>Minimally Impacted Sites</i>              |                   | <b>**Mercury (total) (ng/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>                | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| NL Bear Creek 170154                         | 1.15              | 2.29                            | <b>2.67</b>          | 5.74             | 8.03              | 7                     |
| NL Eighteen Mile Creek 210217                | 0.72              | 1.17                            | <b>2.27</b>          | 5.63             | 7.20              | 8                     |
| NL Anderson Creek 830159                     | 0.69              | 0.90                            | <b>1.96</b>          | 3.13             | 4.61              | 8                     |
| NL Pere Marquette River (Headwaters) 430578  | 0.59              | 1.16                            | <b>1.71</b>          | 1.75             | 2.25              | 8                     |
| NL Paint River 360124                        | 0.89              | 1.01                            | <b>1.66</b>          | 2.65             | 5.23              | 10                    |
| HE Johnson Drain 821417                      | 0.58              | 1.19                            | <b>1.64</b>          | 2.07             | 2.85              | 8                     |
| SM Grand River (Headwaters) 380083           | 0.49              | 1.02                            | <b>1.64</b>          | 2.91             | 3.30              | 12                    |
| SM North Branch Clinton River 500467         | NQ                | 0.76                            | <b>1.62</b>          | 2.49             | 2.68              | 8                     |
| SM Pokagon Creek 140110                      | 0.60              | 1.08                            | <b>1.58</b>          | 3.23             | 7.59              | 6                     |
| SM South Branch Kalamazoo River 130331       | NQ                | 1.02                            | <b>1.48</b>          | 2.06             | 2.53              | 8                     |
| NL Bryan Creek 520258                        | NQ                | 0.68                            | <b>1.43</b>          | 3.51             | 7.41              | 8                     |
| NL East Branch Ontonagon 310468              | 0.59              | 1.08                            | <b>1.37</b>          | 2.43             | 6.84              | 8                     |
| NL Bigelow Creek 630291                      | 0.51              | 0.66                            | <b>1.31</b>          | 2.08             | 7.40              | 11                    |
| HE Black River (Headwaters) 760058           | 0.82              | 0.92                            | <b>1.20</b>          | 1.48             | 2.31              | 8                     |
| NL East Creek 280318                         | NQ                | 0.71                            | <b>1.15</b>          | 1.58             | 6.23              | 12                    |
| SM South Branch Flint River 440173           | ND                | 0.84                            | <b>1.14</b>          | 1.53             | 2.24              | 13                    |
| NL Fox River 770082                          | 0.78              | 0.88                            | <b>1.00</b>          | 2.13             | 2.34              | 7                     |
| NL Pigeon River 160177                       | NQ                | 0.64                            | <b>1.00</b>          | 1.32             | 3.24              | 8                     |
| NL West Branch Tittabawassee 260068          | 0.58              | 0.67                            | <b>0.96</b>          | 1.46             | 5.27              | 12                    |
| SM Huron River (Headwaters) 470521           | NQ                | 0.82                            | <b>0.95</b>          | 1.03             | 1.28              | 12                    |
| HE Evergreen Creek 790157                    | 0.63              | 0.65                            | <b>0.93</b>          | 1.60             | 4.66              | 11                    |
| SM Coldwater River 120215                    | NQ                | 0.69                            | <b>0.92</b>          | 1.04             | 1.87              | 8                     |
| SM Bellamy Creek 340186                      | NQ                | 0.54                            | <b>0.86</b>          | 1.22             | 1.73              | 8                     |
| SM River Raisin (Headwaters) 380393          | NQ                | 0.52                            | <b>0.82</b>          | 1.16             | 1.67              | 11                    |
| NL Perry Creek 680056                        | NQ                | 0.66                            | <b>0.76</b>          | 0.92             | 1.31              | 12                    |
| NL Thunder Bay River (Headwaters) 600051     | NQ                | 0.53                            | <b>0.61</b>          | 0.69             | 2.17              | 8                     |
| NL Tahquamenon River (Headwaters) 480033     | NQ                | 0.45                            | <b>0.45</b>          | 0.67             | 0.73              | 7                     |
| SM Shiawassee River (Headwaters) 631036      | NQ                | 0.36                            | <b>0.36</b>          | 0.36             | 3.63              | 8                     |

| <i>Intensive &amp; Integrator Sites</i> |            | <b>**Nickel (total) (ug/L)</b> |               |           |            |                |
|-----------------------------------------|------------|--------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>   | <u>Min</u> | <u>Q1</u>                      | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| HE Clinton River 500233                 | 2.600      | 3.830                          | <b>4.430</b>  | 5.680     | 12.700     | 65             |
| HE Flint River 730285                   | 2.150      | 3.410                          | <b>4.040</b>  | 4.700     | 8.730      | 31             |
| HE Huron River 580364                   | 2.030      | 2.750                          | <b>3.010</b>  | 3.440     | 4.410      | 31             |
| SM Grand River (Upper) 340025           | 1.930      | 2.690                          | <b>2.990</b>  | 3.230     | 16.900     | 31             |
| HE Saginaw River 090177                 | ND         | 2.460                          | <b>2.930</b>  | 3.320     | 5.420      | 60             |
| SM Grand River (Lower) 700123           | 1.990      | 2.440                          | <b>2.920</b>  | 3.340     | 5.147      | 79             |
| HE Cass River 730024                    | 1.810      | 2.170                          | <b>2.840</b>  | 3.320     | 4.540      | 31             |
| HE River Raisin 580046                  | 1.910      | 2.620                          | <b>2.800</b>  | 3.210     | 6.000      | 31             |
| HE River Rouge 820070                   | 0.964      | 2.240                          | <b>2.610</b>  | 3.550     | 7.430      | 34             |
| HE Shiawassee River 730023              | 1.470      | 2.000                          | <b>2.250</b>  | 2.440     | 3.030      | 34             |
| SM St. Joseph River (Lower) 110628      | 1.510      | 1.790                          | <b>2.100</b>  | 2.440     | 3.399      | 51             |
| SM Kalamazoo River (Lower) 030077       | 1.320      | 1.790                          | <b>2.080</b>  | 2.480     | 4.320      | 79             |
| HE Tittabawassee River 730025           | 1.060      | 1.570                          | <b>1.770</b>  | 1.930     | 2.730      | 31             |
| SM Kalamazoo River (Upper) 390598       | 1.220      | 1.580                          | <b>1.730</b>  | 2.020     | 3.880      | 31             |
| NL Pine River 490006                    | 0.900      | 1.030                          | <b>1.360</b>  | 2.460     | 6.020      | 31             |
| SM St. Joseph River (Upper) 750273      | 0.950      | 1.150                          | <b>1.255</b>  | 1.560     | 2.110      | 26             |
| NL Ontonagon River 660038               | 0.657      | 0.789                          | <b>1.110</b>  | 1.640     | 3.250      | 23             |
| SM Muskegon River (Lower) 610273        | 0.598      | 0.736                          | <b>0.886</b>  | 1.110     | 2.130      | 78             |
| SM Pere Marquette River 530027          | 0.522      | 0.722                          | <b>0.867</b>  | 1.060     | 3.190      | 47             |
| NL Thunder Bay River 040123             | 0.537      | 0.633                          | <b>0.835</b>  | 0.933     | 1.880      | 34             |
| NL Muskegon River (Upper) 670008        | 0.575      | 0.729                          | <b>0.815</b>  | 0.990     | 1.830      | 32             |
| NL Menominee River 550038               | 0.523      | 0.680                          | <b>0.774</b>  | 0.850     | 1.000      | 31             |
| NL Escanaba River 210102                | 0.330      | 0.620                          | <b>0.770</b>  | 0.853     | 1.305      | 47             |
| NC Manistee River 510088                | 0.602      | 0.659                          | <b>0.750</b>  | 0.905     | 1.530      | 31             |
| NC Boardman River 280014                | 0.486      | 0.600                          | <b>0.696</b>  | 0.815     | 1.000      | 28             |
| NL Cheboygan River 160073               | 0.463      | 0.600                          | <b>0.661</b>  | 0.793     | 1.460      | 34             |
| NL Au Sable River 350061                | 0.397      | 0.530                          | <b>0.610</b>  | 0.716     | 1.260      | 66             |
| NL Sturgeon River 210032                | ND         | 0.515                          | <b>0.600</b>  | 0.660     | 0.860      | 31             |
| NL Manistique River 770073              | NQ         | 0.433                          | <b>0.517</b>  | 0.600     | 0.918      | 44             |
| NL Tahquamenon River 170141             | 0.344      | 0.422                          | <b>0.494</b>  | 0.631     | 3.174      | 44             |

| <i>Minimally Impacted Sites</i>              | <b>**Nickel (total) (ug/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|--------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>              | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 2.390                          | 2.520            | <b>2.750</b>         | 3.195            | 3.540             | 4                     |
| SM Bellamy Creek 340186                      | 1.530                          | 1.700            | <b>2.055</b>         | 2.550            | 2.860             | 4                     |
| SM Huron River (Headwaters) 470521           | 1.850                          | 1.850            | <b>1.930</b>         | 2.090            | 2.170             | 4                     |
| SM South Branch Kalamazoo River 130331       | 1.210                          | 1.235            | <b>1.500</b>         | 1.875            | 2.010             | 4                     |
| SM North Branch Clinton River 500467         | 1.160                          | 1.200            | <b>1.430</b>         | 1.755            | 1.890             | 4                     |
| SM Grand River (Headwaters) 380083           | 0.540                          | 0.920            | <b>1.345</b>         | 1.720            | 2.050             | 4                     |
| SM South Branch Flint River 440173           | 0.954                          | 1.117            | <b>1.295</b>         | 1.315            | 1.320             | 4                     |
| HE Evergreen Creek 790157                    | 1.180                          | 1.185            | <b>1.280</b>         | 1.530            | 1.690             | 4                     |
| SM River Raisin (Headwaters) 380393          | 0.840                          | 0.980            | <b>1.145</b>         | 1.175            | 1.180             | 4                     |
| SM Pokagon Creek 140110                      | 0.923                          | 0.950            | <b>1.125</b>         | 1.305            | 1.610             | 8                     |
| NL Bear Creek 170154                         | 1.000                          | 1.000            | <b>1.075</b>         | 1.150            | 1.150             | 4                     |
| SM Shiawassee River (Headwaters) 631036      | 0.940                          | 0.970            | <b>1.000</b>         | 1.005            | 1.010             | 4                     |
| NL West Branch Tittabawassee 260068          | 0.669                          | 0.749            | <b>0.919</b>         | 1.030            | 1.050             | 4                     |
| NL Perry Creek 680056                        | 0.727                          | 0.735            | <b>0.876</b>         | 1.065            | 1.120             | 4                     |
| NL Pigeon River 160177                       | 0.663                          | 0.736            | <b>0.826</b>         | 1.096            | 1.350             | 4                     |
| NL Anderson Creek 830159                     | 0.727                          | 0.728            | <b>0.756</b>         | 0.937            | 1.090             | 4                     |
| NL Thunder Bay River (Headwaters) 600051     | 0.565                          | 0.613            | <b>0.686</b>         | 0.946            | 1.180             | 4                     |
| NL Bigelow Creek 630291                      | 0.570                          | 0.605            | <b>0.655</b>         | 0.690            | 0.710             | 4                     |
| NL East Creek 280318                         | 0.606                          | 0.607            | <b>0.636</b>         | 0.721            | 0.776             | 4                     |
| NL Pere Marquette River (Headwaters) 430578  | 0.446                          | 0.473            | <b>0.534</b>         | 0.585            | 0.602             | 4                     |
| NL Bryan Creek 520258                        | 0.409                          | 0.422            | <b>0.445</b>         | 0.479            | 0.503             | 4                     |
| NL Tahquamenon River (Headwaters) 480033     | NQ                             | 0.335            | <b>0.421</b>         | 0.553            | 0.634             | 4                     |
| NL Paint River 360124                        | 0.365                          | 0.379            | <b>0.397</b>         | 0.529            | 0.658             | 4                     |
| NL Fox River 770082                          | NQ                             | 0.300            | <b>0.317</b>         | 0.383            | 0.433             | 4                     |

| <i>Intensive &amp; Integrator Sites</i>      |                   | <b>**Cadmium (total) (ug/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>                | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE River Rouge 820070                        | ND                | 0.024                           | <b>0.060</b>         | 0.082            | 0.160             | 34                    |
| HE Clinton River 500233                      | NQ                | 0.040                           | <b>0.056</b>         | 0.090            | 0.414             | 65                    |
| NL Escanaba River 210102                     | NQ                | 0.024                           | <b>0.044</b>         | 0.060            | 0.121             | 45                    |
| SM St. Joseph River (Lower) 110628           | NQ                | 0.037                           | <b>0.037</b>         | 0.047            | 0.160             | 51                    |
| SM Grand River (Lower) 700123                | ND                | 0.037                           | <b>0.037</b>         | 0.041            | 0.094             | 76                    |
| HE Cass River 730024                         | ND                | 0.037                           | <b>0.037</b>         | 0.037            | 0.050             | 29                    |
| HE River Raisin 580046                       | ND                | 0.024                           | <b>0.024</b>         | 0.038            | 0.110             | 29                    |
| HE Tittabawassee River 730025                | ND                | 0.006                           | <b>0.024</b>         | 0.024            | 0.053             | 25                    |
| SM Grand River (Upper) 340025                | ND                | 0.024                           | <b>0.024</b>         | 0.040            | 0.390             | 31                    |
| SM Kalamazoo River (Lower) 030077            | ND                | 0.024                           | <b>0.024</b>         | 0.024            | 0.060             | 77                    |
| HE Flint River 730285                        | ND                | 0.024                           | <b>0.024</b>         | 0.044            | 0.202             | 29                    |
| HE Shiawassee River 730023                   | ND                | 0.024                           | <b>0.024</b>         | 0.024            | 0.040             | 30                    |
| HE Saginaw River 090177                      | ND                | 0.024                           | <b>0.024</b>         | 0.024            | 0.170             | 57                    |
| HE Huron River 580364                        | ND                | 0.024                           | <b>0.024</b>         | 0.040            | 0.066             | 29                    |
| SM Kalamazoo River (Upper) 390598            | ND                | 0.024                           | <b>0.024</b>         | 0.067            | 0.097             | 31                    |
| NC Boardman River 280014                     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 16                    |
| NL Muskegon River (Upper) 670008             | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.060             | 25                    |
| NL Pine River 490006                         | ND                | 0.006                           | <b>0.006</b>         | 0.024            | 0.069             | 29                    |
| SM Pere Marquette River 530027               | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 41                    |
| SM Muskegon River (Lower) 610273             | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.050             | 55                    |
| NL Cheboygan River 160073                    | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 25                    |
| NL Sturgeon River 210032                     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 25                    |
| NC Manistee River 510088                     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 22                    |
| NL Tahquamenon River 170141                  | ND                | 0.006                           | <b>0.006</b>         | 0.024            | 0.171             | 39                    |
| NL Au Sable River 350061                     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 37                    |
| NL Menominee River 550038                    | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 25                    |
| NL Ontonagon River 660038                    | ND                | 0.006                           | <b>0.006</b>         | 0.024            | 0.050             | 19                    |
| NL Manistique River 770073                   | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.037             | 31                    |
| NL Thunder Bay River 040123                  | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 25                    |
| SM St. Joseph River (Upper) 750273           | ND                | 0.006                           | <b>0.006</b>         | 0.024            | 0.037             | 22                    |

| <i>Minimally Impacted Sites</i>              |                   | <b>**Cadmium (total) (ug/L)</b> |                      |                  |                   |                       |
|----------------------------------------------|-------------------|---------------------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b> | <b><u>Q1</u></b>                | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| NL Paint River 360124                        | NQ                | 0.024                           | <b>0.024</b>         | 0.024            | 0.037             | 1                     |
| HE Evergreen Creek 790157                    | NQ                | 0.024                           | <b>0.024</b>         | 0.024            | 0.037             | 2                     |
| HE Johnson Drain 821417                      | NQ                | 0.024                           | <b>0.024</b>         | 0.035            | 0.046             | 4                     |
| SM South Branch Kalamazoo River 130331       | ND                | 0.015                           | <b>0.024</b>         | 0.024            | 0.037             | 4                     |
| NL Anderson Creek 830159                     | ND                | 0.006                           | <b>0.015</b>         | 0.024            | 0.037             | 4                     |
| NL Bear Creek 170154                         | ND                | 0.006                           | <b>0.015</b>         | 0.024            | 0.037             | 4                     |
| SM Bellamy Creek 340186                      | ND                | 0.006                           | <b>0.015</b>         | 0.024            | 0.037             | 4                     |
| SM Pokagon Creek 140110                      | ND                | 0.006                           | <b>0.015</b>         | 0.024            | 0.039             | 6                     |
| NL Tahquamenon River (Headwaters) 480033     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| NL Pere Marquette River (Headwaters) 430578  | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| NL Fox River 770082                          | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| NL East Creek 280318                         | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 1                     |
| NL Bigelow Creek 630291                      | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 2                     |
| NL Bryan Creek 520258                        | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| NL Pigeon River 160177                       | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| NL West Branch Tittabawassee 260068          | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 2                     |
| SM South Branch Flint River 440173           | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 2                     |
| NL Thunder Bay River (Headwaters) 600051     | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| SM River Raisin (Headwaters) 380393          | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 2                     |
| SM North Branch Clinton River 500467         | ND                | 0.006                           | <b>0.006</b>         | 0.015            | 0.037             | 4                     |
| SM Shiawassee River (Headwaters) 631036      | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 4                     |
| SM Grand River (Headwaters) 380083           | ND                | 0.006                           | <b>0.006</b>         | 0.015            | 0.037             | 4                     |
| SM Huron River (Headwaters) 470521           | ND                | 0.006                           | <b>0.006</b>         | 0.006            | 0.011             | 2                     |

| <i>Intensive &amp; Integrator Sites</i> |            | <b>**Zinc (total) (ug/L)</b> |               |           |            |                |
|-----------------------------------------|------------|------------------------------|---------------|-----------|------------|----------------|
| <u>Ecoregion / Site Name / STORET</u>   | <u>Min</u> | <u>Q1</u>                    | <u>Median</u> | <u>Q3</u> | <u>Max</u> | <u>samples</u> |
| HE Clinton River 500233                 | 5.53       | 9.72                         | <b>12.85</b>  | 21.60     | 122.00     | 60             |
| HE River Rouge 820070                   | 0.92       | 8.25                         | <b>12.20</b>  | 17.10     | 28.80      | 32             |
| HE Flint River 730285                   | 3.88       | 7.84                         | <b>9.84</b>   | 14.40     | 87.30      | 27             |
| SM Kalamazoo River (Upper) 390598       | 2.53       | 3.83                         | <b>5.87</b>   | 8.45      | 12.10      | 24             |
| HE Saginaw River 090177                 | 2.82       | 4.53                         | <b>5.34</b>   | 7.38      | 34.80      | 52             |
| SM Grand River (Lower) 700123           | 2.61       | 3.91                         | <b>5.05</b>   | 7.55      | 29.90      | 70             |
| HE Huron River 580364                   | 2.74       | 3.67                         | <b>4.96</b>   | 7.83      | 54.60      | 28             |
| HE Cass River 730024                    | 2.37       | 3.24                         | <b>4.45</b>   | 5.43      | 13.30      | 27             |
| NL Escanaba River 210102                | 1.74       | 3.27                         | <b>4.22</b>   | 5.84      | 10.50      | 39             |
| SM St. Joseph River (Lower) 110628      | 1.94       | 2.80                         | <b>3.90</b>   | 5.15      | 28.51      | 45             |
| HE River Raisin 580046                  | 1.83       | 2.57                         | <b>3.89</b>   | 8.45      | 22.10      | 25             |
| SM Kalamazoo River (Lower) 030077       | 1.84       | 2.76                         | <b>3.69</b>   | 4.64      | 11.70      | 69             |
| SM Grand River (Upper) 340025           | 1.49       | 2.63                         | <b>3.46</b>   | 5.41      | 75.50      | 27             |
| NL Pine River 490006                    | 1.36       | 2.23                         | <b>3.05</b>   | 5.62      | 16.50      | 25             |
| HE Tittabawassee River 730025           | 1.43       | 1.94                         | <b>2.94</b>   | 4.40      | 10.90      | 27             |
| HE Shiawassee River 730023              | 1.69       | 2.33                         | <b>2.74</b>   | 4.67      | 6.79       | 30             |
| NL Ontonagon River 660038               | 0.45       | 0.93                         | <b>1.48</b>   | 2.39      | 6.67       | 18             |
| NL Sturgeon River 210032                | 0.44       | 0.85                         | <b>1.45</b>   | 1.74      | 3.79       | 26             |
| SM Pere Marquette River 530027          | 0.59       | 0.99                         | <b>1.39</b>   | 2.06      | 16.84      | 43             |
| NL Menominee River 550038               | 0.63       | 0.91                         | <b>1.29</b>   | 1.77      | 7.28       | 22             |
| NL Muskegon River (Upper) 670008        | 0.67       | 0.98                         | <b>1.29</b>   | 1.69      | 3.30       | 26             |
| SM St. Joseph River (Upper) 750273      | 0.67       | 0.91                         | <b>1.21</b>   | 1.48      | 3.42       | 22             |
| NL Tahquamenon River 170141             | NQ         | 0.58                         | <b>1.05</b>   | 2.69      | 177.00     | 37             |
| NL Manistique River 770073              | NQ         | 0.64                         | <b>0.85</b>   | 1.02      | 2.26       | 36             |
| SM Muskegon River (Lower) 610273        | NQ         | 0.58                         | <b>0.80</b>   | 1.65      | 17.82      | 66             |
| NC Manistee River 510088                | NQ         | 0.61                         | <b>0.72</b>   | 0.95      | 1.74       | 24             |
| NL Thunder Bay River 040123             | NQ         | 0.28                         | <b>0.54</b>   | 0.85      | 1.57       | 31             |
| NC Boardman River 280014                | NQ         | 0.28                         | <b>0.50</b>   | 0.60      | 1.67       | 22             |
| NL Cheboygan River 160073               | ND         | 0.43                         | <b>0.43</b>   | 0.43      | 3.65       | 30             |
| NL Au Sable River 350061                | ND         | 0.28                         | <b>0.28</b>   | 0.28      | 4.61       | 57             |

| <i>Minimally Impacted Sites</i>              | <b>**Zinc (total) (ug/L)</b> |                  |                      |                  |                   |                       |
|----------------------------------------------|------------------------------|------------------|----------------------|------------------|-------------------|-----------------------|
| <b><u>Ecoregion / Site Name / STORET</u></b> | <b><u>Min</u></b>            | <b><u>Q1</u></b> | <b><u>Median</u></b> | <b><u>Q3</u></b> | <b><u>Max</u></b> | <b><u>samples</u></b> |
| HE Johnson Drain 821417                      | 6.48                         | 6.80             | <b>7.54</b>          | 10.44            | 12.90             | 4                     |
| NL Bear Creek 170154                         | 1.22                         | 1.22             | <b>2.00</b>          | 3.10             | 3.10              | 3                     |
| SM Pokagon Creek 140110                      | 0.77                         | 1.34             | <b>1.97</b>          | 2.54             | 5.40              | 8                     |
| NL Anderson Creek 830159                     | 1.93                         | 1.93             | <b>1.93</b>          | 1.93             | 1.93              | 1                     |
| SM Grand River (Headwaters) 380083           | 0.98                         | 1.25             | <b>1.78</b>          | 2.17             | 2.30              | 4                     |
| SM North Branch Clinton River 500467         | 0.89                         | 0.89             | <b>1.49</b>          | 2.09             | 2.09              | 2                     |
| SM Huron River (Headwaters) 470521           | 0.66                         | 0.92             | <b>1.30</b>          | 1.53             | 1.63              | 4                     |
| SM Bellamy Creek 340186                      | 0.95                         | 0.95             | <b>1.05</b>          | 1.14             | 1.14              | 2                     |
| NL West Branch Tittabawassee 260068          | 0.56                         | 0.77             | <b>0.99</b>          | 1.25             | 1.50              | 4                     |
| SM South Branch Kalamazoo River 130331       | 0.47                         | 0.47             | <b>0.99</b>          | 1.50             | 1.50              | 2                     |
| NL Pere Marquette River (Headwaters) 430578  | NQ                           | 0.51             | <b>0.84</b>          | 1.31             | 1.68              | 4                     |
| HE Evergreen Creek 790157                    | 0.73                         | 0.77             | <b>0.82</b>          | 1.31             | 1.78              | 4                     |
| NL Bigelow Creek 630291                      | 0.54                         | 0.58             | <b>0.81</b>          | 1.00             | 1.00              | 4                     |
| SM River Raisin (Headwaters) 380393          | 0.65                         | 0.65             | <b>0.80</b>          | 0.98             | 0.98              | 3                     |
| NL Bryan Creek 520258                        | NQ                           | 0.48             | <b>0.73</b>          | 0.85             | 0.91              | 4                     |
| SM Shiawassee River (Headwaters) 631036      | 0.66                         | 0.67             | <b>0.73</b>          | 1.34             | 1.91              | 4                     |
| SM South Branch Flint River 440173           | 0.44                         | 0.52             | <b>0.68</b>          | 0.81             | 0.85              | 4                     |
| NL East Creek 280318                         | 0.43                         | 0.47             | <b>0.53</b>          | 0.58             | 0.61              | 4                     |
| NL Fox River 770082                          | NQ                           | 0.28             | <b>0.52</b>          | 0.71             | 0.71              | 3                     |
| NL Paint River 360124                        | NQ                           | 0.28             | <b>0.46</b>          | 0.47             | 0.47              | 3                     |
| NL Perry Creek 680056                        | NQ                           | 0.28             | <b>0.40</b>          | 0.53             | 0.54              | 4                     |
| NL Pigeon River 160177                       | NQ                           | 0.28             | <b>0.38</b>          | 0.58             | 0.68              | 4                     |
| NL Thunder Bay River (Headwaters) 600051     | NQ                           | 0.28             | <b>0.38</b>          | 0.48             | 0.49              | 4                     |
| NL Tahquamenon River (Headwaters) 480033     | ND                           | 0.07             | <b>0.28</b>          | 0.80             | 0.80              | 3                     |



**Sample Sizes for Uncensored Parameters****Sample Size**

| <b><u>Intensive &amp; Integrator Sites (Main) Sites</u></b> | <b><u>pH</u></b> | <b>Sample Size</b>                              |                        |                                                                        |                                                                        |
|-------------------------------------------------------------|------------------|-------------------------------------------------|------------------------|------------------------------------------------------------------------|------------------------------------------------------------------------|
|                                                             |                  | <b><u>Dissolved</u></b><br><b><u>Oxygen</u></b> | <b><u>Hardness</u></b> | <b><u>Specific</u></b><br><b><u>Conduct-</u></b><br><b><u>ance</u></b> | <b><u>Total</u></b><br><b><u>Dissolved</u></b><br><b><u>Solids</u></b> |
| NL Cheboygan River 160073                                   | 71               | 73                                              | 74                     | 73                                                                     | 70                                                                     |
| HE Shiawassee River 730023                                  | 74               | 74                                              | 74                     | 74                                                                     | 72                                                                     |
| HE Black River 740267                                       | 48               | 48                                              | 48                     | 48                                                                     | 46                                                                     |
| HE Flint River 730285                                       | 78               | 78                                              | 78                     | 78                                                                     | 72                                                                     |
| NL Thunder Bay River 040123                                 | 71               | 71                                              | 74                     | 71                                                                     | 70                                                                     |
| SM St. Joseph River (Lower) 110628                          | 89               | 84                                              | 91                     | 87                                                                     | 89                                                                     |
| SM Grand River (Lower) 700123                               | 174              | 173                                             | 174                    | 174                                                                    | 168                                                                    |
| HE River Raisin 580046                                      | 78               | 78                                              | 78                     | 77                                                                     | 71                                                                     |
| NL Au Sable River 350061                                    | 156              | 157                                             | 160                    | 157                                                                    | 153                                                                    |
| HE Cass River 730024                                        | 77               | 77                                              | 79                     | 77                                                                     | 77                                                                     |
| HE Tittabawassee River 730025                               | 79               | 79                                              | 79                     | 79                                                                     | 77                                                                     |
| NC Boardman River 280014                                    | 75               | 74                                              | 75                     | 75                                                                     | 67                                                                     |
| NC Manistee River 510088                                    | 71               | 71                                              | 71                     | 71                                                                     | 69                                                                     |
| NL Menominee River 550038                                   | 85               | 85                                              | 87                     | 85                                                                     | 84                                                                     |
| SM Grand River (Upper) 340025                               | 79               | 78                                              | 79                     | 79                                                                     | 77                                                                     |
| SM Kalamazoo River (Lower) 030077                           | 174              | 173                                             | 174                    | 174                                                                    | 168                                                                    |
| SM Muskegon River (Lower) 610273                            | 172              | 170                                             | 173                    | 171                                                                    | 167                                                                    |
| NL Muskegon River (Upper) 670008                            | 80               | 80                                              | 80                     | 80                                                                     | 78                                                                     |
| NL Escanaba River 210102                                    | 87               | 87                                              | 91                     | 88                                                                     | 88                                                                     |
| HE Huron River 580364                                       | 79               | 79                                              | 79                     | 79                                                                     | 77                                                                     |
| HE Saginaw River 090177                                     | 153              | 152                                             | 157                    | 153                                                                    | 149                                                                    |
| NL Pine River 490006                                        | 68               | 69                                              | 70                     | 69                                                                     | 68                                                                     |
| SM Kalamazoo River (Upper) 390598                           | 78               | 77                                              | 79                     | 78                                                                     | 77                                                                     |
| SM Pere Marquette River 530027                              | 91               | 90                                              | 91                     | 90                                                                     | 89                                                                     |
| SM St. Joseph River (Upper) 750273                          | 73               | 71                                              | 73                     | 73                                                                     | 72                                                                     |
| NL Ontonagon River 660038                                   | 70               | 69                                              | 71                     | 70                                                                     | 63                                                                     |
| HE Clinton River 500233                                     | 160              | 160                                             | 161                    | 160                                                                    | 155                                                                    |
| HE River Rouge 820070                                       | 74               | 74                                              | 74                     | 74                                                                     | 72                                                                     |
| NL Sturgeon River 210032                                    | 78               | 78                                              | 79                     | 78                                                                     | 76                                                                     |
| NL Manistique River 770073                                  | 92               | 92                                              | 91                     | 92                                                                     | 89                                                                     |
| NL Tahquamenon River 170141                                 | 81               | 82                                              | 84                     | 83                                                                     | 81                                                                     |

**Sample Sizes for Uncensored Parameters****Sample Size**

| <u>Minimally Impacted Sites</u>             | <u>pH</u> | <u>Dissolved<br/>Oxygen</u> | <u>Hardness</u> | <u>Specific<br/>Conduct-<br/>ance</u> | <u>Total<br/>Dissolved<br/>Solids</u> |
|---------------------------------------------|-----------|-----------------------------|-----------------|---------------------------------------|---------------------------------------|
| HE Black River (Headwaters) 760058          | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Pere Marquette River (Headwaters) 430578 | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Pigeon River 160177                      | 7         | 8                           | 8               | 8                                     | 8                                     |
| NL Bigelow Creek 630291                     | 12        | 12                          | 12              | 12                                    | 12                                    |
| NL Tahquamenon River (Headwaters) 480033    | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Thunder Bay River (Headwaters) 600051    | 7         | 8                           | 8               | 8                                     | 8                                     |
| SM Coldwater River 120215                   | 8         | 8                           | 8               | 8                                     | 8                                     |
| HE Evergreen Creek 790157                   | 12        | 12                          | 12              | 12                                    | 12                                    |
| NL West Branch Tittabawassee 260068         | 12        | 12                          | 12              | 12                                    | 12                                    |
| NL East Creek 280318                        | 12        | 12                          | 12              | 12                                    | 10                                    |
| NL Perry Creek 680056                       | 12        | 12                          | 12              | 12                                    | 12                                    |
| SM South Branch Flint River 440173          | 12        | 12                          | 12              | 12                                    | 10                                    |
| NL Paint River 360124                       | 11        | 11                          | 12              | 11                                    | 12                                    |
| SM Bellamy Creek 340186                     | 8         | 8                           | 8               | 8                                     | 8                                     |
| SM Grand River (Headwaters) 380083          | 12        | 12                          | 12              | 12                                    | 12                                    |
| SM Pokagon Creek 140110                     | 8         | 8                           | 8               | 8                                     | 8                                     |
| SM Shiawassee River (Headwaters) 631036     | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL East Branch Ontonagon 310468             | 8         | 7                           | 8               | 8                                     | 5                                     |
| SM Huron River (Headwaters) 470521          | 12        | 12                          | 12              | 12                                    | 12                                    |
| HE Johnson Drain 821417                     | 8         | 8                           | 8               | 8                                     | 8                                     |
| SM River Raisin (Headwaters) 380393         | 12        | 12                          | 12              | 12                                    | 10                                    |
| NL Anderson Creek 830159                    | 8         | 7                           | 8               | 8                                     | 8                                     |
| SM South Branch Kalamazoo River 130331      | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Eighteen Mile Creek 210217               | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Bryan Creek 520258                       | 8         | 8                           | 8               | 8                                     | 8                                     |
| SM North Branch Clinton River 500467        | 7         | 7                           | 8               | 7                                     | 8                                     |
| NL Bear Creek 170154                        | 8         | 8                           | 8               | 8                                     | 8                                     |
| NL Fox River 770082                         | 8         | 8                           | 8               | 8                                     | 8                                     |

**Appendix C-2.** Great Lakes tributary water quality (conventionals) data summary broken down by ecoregion. Refer to Appendix C-4 for more details.

\* = significant difference

| Ecoregion        | Highest Median Concentrations at Main Sites |       | Lowest Median Concentrations at Main Sites |       | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations?                                                                        |
|------------------|---------------------------------------------|-------|--------------------------------------------|-------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                  | Site                                        | mg/L  | Site                                       | mg/L  |                                                                                                                                                                                       |
| Total Phosphorus |                                             |       |                                            |       |                                                                                                                                                                                       |
| SMNIDP           | Grand River (Upper)                         | 0.109 | St. Joseph River (Upper)                   | 0.034 | ▪ <b>1 out of 8 watersheds</b><br>▪ Pokagon Creek (0.048 mg/L) vs. St. Joseph River (Upper) (0.034 mg/L) *                                                                            |
|                  | Grand River (Lower)                         | 0.107 | Pere Marquette River                       | 0.033 |                                                                                                                                                                                       |
|                  | Kalamazoo River (Lower)                     | 0.079 | Muskegon River (Lower)                     | 0.027 |                                                                                                                                                                                       |
| HELP             | Clinton River                               | 0.145 | Shiawassee River                           | 0.058 |                                                                                                                                                                                       |
|                  | Flint River                                 | 0.135 | Tittabawassee River                        | 0.057 |                                                                                                                                                                                       |
|                  | Saginaw River                               | 0.100 | Huron River                                | 0.050 |                                                                                                                                                                                       |
| NCHF             | Manistee River                              | 0.020 | Boardman River                             | 0.010 | ▪ <b>2 out of 11 watersheds</b><br>▪ Fox River (0.024 mg/L) vs. Manistique River (0.018 mg/L) *<br>▪ Pigeon River (0.015 mg/L) vs. Cheboygan River (0.008 mg/L) *                     |
| NLAF             | Pine River                                  | 0.061 | Thunder Bay River                          | 0.016 |                                                                                                                                                                                       |
|                  | Ontonagon River                             | 0.040 | Au Sable River                             | 0.010 |                                                                                                                                                                                       |
|                  | Escanaba River                              | 0.037 | Cheboygan River                            | 0.008 |                                                                                                                                                                                       |
| Orthophosphate   |                                             |       |                                            |       |                                                                                                                                                                                       |
| SMNIDP           | Grand River (Upper)                         | 0.040 | Pere Marquette River                       | 0.010 | ▪ <b>1 out of 8 watersheds</b><br>▪ Pokagon Creek (0.012 mg/L) vs. St. Joseph River (Upper) (0.006 mg/L) *                                                                            |
|                  | Grand River (Lower)                         | 0.026 | Muskegon River (Lower)                     | 0.007 |                                                                                                                                                                                       |
|                  | Kalamazoo River (Upper)                     | 0.014 | St. Joseph River (Upper)                   | 0.006 |                                                                                                                                                                                       |
| HELP             | Clinton River                               | 0.069 | Cass River                                 | 0.014 | ▪ <b>1 out of 10 watersheds</b><br>▪ Black River (Headwaters) (0.013 mg/L) vs. Black River (0.010 mg/L)                                                                               |
|                  | Flint River                                 | 0.051 | Black River                                | 0.010 |                                                                                                                                                                                       |
|                  | Saginaw River                               | 0.031 | Huron River                                | 0.010 |                                                                                                                                                                                       |
| NCHF             | ▪ Boardman River<br>▪ Manistee River        | 0.005 | --                                         | --    | ▪ <b>2 out of 11 watersheds</b><br>▪ Fox River (0.008 mg/L) vs. Manistique River (0.005 mg/L) *<br>▪ Tahquamenon River (Headwaters) (0.006 mg/L) vs. Tahquamenon River (0.005 mg/L) * |
| NLAF             | Pine River                                  | 0.018 | ▪ Au Sable River<br>▪ Cheboygan River      | 0.005 |                                                                                                                                                                                       |
|                  | Ontonagon River                             | 0.013 | ▪ Manistique River<br>▪ Sturgeon River     |       |                                                                                                                                                                                       |
|                  |                                             |       | ▪ Tahquamenon River                        |       |                                                                                                                                                                                       |
|                  | Escanaba River                              | 0.010 | ▪ Thunder Bay River                        |       |                                                                                                                                                                                       |

| Ecoregion | Highest Median Concentrations at Main Sites |      | Lowest Median Concentrations at Main Sites |      | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations? |
|-----------|---------------------------------------------|------|--------------------------------------------|------|----------------------------------------------------------------------------------------------------------------|
|           | Site                                        | mg/L | Site                                       | mg/L |                                                                                                                |
| Nit       |                                             |      |                                            |      |                                                                                                                |

| Ecoregion               | Highest Median Concentrations at Main Sites |      | Lowest Median Concentrations at Main Sites |      | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations? |
|-------------------------|---------------------------------------------|------|--------------------------------------------|------|----------------------------------------------------------------------------------------------------------------|
|                         | Site                                        | mg/L | Site                                       | mg/L |                                                                                                                |
| Total Kjeldahl Nitrogen |                                             |      |                                            |      |                                                                                                                |
| SMNIDP                  | Grand River (Lower)                         | 1.00 | St. Joseph River (Upper)                   | 0.54 | ▪ <b>1 out of 8 watersheds</b><br>▪ Pokagon Creek (0.60 mg/L) vs. St. Joseph River (Upper) (0.54 mg/L)         |
|                         | Grand River (Upper)                         | 0.94 | Muskegon River (Lower)                     | 0.41 |                                                                                                                |
|                         | Kalamazoo River (Lower)                     | 0    |                                            |      |                                                                                                                |

| Ecoregion            | Highest Median Concentrations at Main Sites |      | Lowest Median Concentrations at Main Sites |      | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations? |
|----------------------|---------------------------------------------|------|--------------------------------------------|------|----------------------------------------------------------------------------------------------------------------|
|                      | Site                                        | mg/L | Site                                       | mg/L |                                                                                                                |
| Total Organic Carbon |                                             |      |                                            |      |                                                                                                                |
| SMNIDP               | Grand River (Upper)                         | 8.7  | St. Joseph River (Upper)                   | 5.4  | ▪ <b>1 out of 8 watersheds</b><br>▪ Coldwater River (6.3 mg/L) vs. St. Joseph                                  |

| Ecoregion | Highest Median Concentrations at Main Sites |  | Lowest Median Concentrations at Main Sites |  | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations? |
|-----------|---------------------------------------------|--|--------------------------------------------|--|----------------------------------------------------------------------------------------------------------------|
|           | Site                                        |  |                                            |  |                                                                                                                |

| <b>Ecoregion</b> | <b>Highest Median Concentrations at Main Sites</b> | <b>Site</b> | <b>mg/L</b>              | <b>Lowest Median Concentrations at Main Sites</b> | <b>Site</b> | <b>mg/L</b> | <b>Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations?</b>                                                                                                                                                                                                                                     |
|------------------|----------------------------------------------------|-------------|--------------------------|---------------------------------------------------|-------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Sodium</b>    |                                                    |             |                          |                                                   |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| SMNIDP           | Grand River (Lower)                                | 28.0        | Muskegon River (Lower)   | 10.5                                              |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Grand River (Upper)                                | 25.6        | St. Joseph River (Upper) | 10.4                                              |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Kalamazoo River (Lower)                            | 23.4        | Pere Marquette River     | 7.9                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| HELP             | Clinton River                                      | 88.0        | Black River              | 27.0                                              |             |             | <ul style="list-style-type: none"> <li>▪ <b>3 out of 10 watersheds</b></li> <li>▪ Huron River (Headwaters) (<i>located in the SMNIDP ecoregion</i>) (65.7 mg/L) vs. Huron River (50.8 mg/L) *</li> <li>▪ Johnson Drain (71.8 mg/L) vs. River Rouge (42.6 mg/L) *</li> <li>▪ Black River (Headwaters) (38.5 mg/L) vs. Black River (27.0 mg/L) *</li> </ul> |
|                  | Huron River                                        | 50.8        | River Raisin             | 21.7                                              |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Tittabawassee River                                | 49.0        | Cass River               | 18.0                                              |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| NCHF             | Manistee River                                     | 7.0         | Boardman River           | 5.2                                               |             |             | <ul style="list-style-type: none"> <li>▪ <b>1 out of 2 watersheds</b></li> <li>▪ East Creek (<i>located in the NLA ecoregion</i>) (5.3 mg/L) vs. Boardman River (5.2 mg/L)</li> </ul>                                                                                                                                                                     |
| NLA              | Escanaba River                                     | 45.2        | Tahquamenon River        | 2.0                                               |             |             | <ul style="list-style-type: none"> <li>▪ <b>1 out of 11 watersheds</b></li> <li>▪ Perry Creek (8.6 mg/L) vs. Au Sable River (5.1 mg/L) *</li> </ul>                                                                                                                                                                                                       |
|                  | Muskegon River (Upper)                             | 9.7         | Manistique River         | 1.9                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Menominee River                                    | 8.9         | Sturgeon River           | 1.7                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| <b>Hardness</b>  |                                                    |             |                          |                                                   |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| SMNIDP           | Grand River (Upper)                                | 282         | Kalamazoo River (Lower)  | 245                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Kalamazoo River (Upper)                            | 279         | Pere Marquette River     | 167                                               |             |             | ▪ <b>4 out of 8 watersheds</b> ; (2 of the 4 had significant differences*)                                                                                                                                                                                                                                                                                |
|                  | St. Joseph River (Lower)                           | 263         | Muskegon River (Lower)   | 165                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| HELP             | Huron River                                        | 351         | Saginaw River            | 234                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Black River                                        | 298         | Tittabawassee River      | 226                                               |             |             | ▪ <b>4 out of 10 watersheds</b> ; (3 of the 4 had significant differences*)                                                                                                                                                                                                                                                                               |
|                  | Cass River                                         | 284         | River Rouge              | 150                                               |             |             |                                                                                                                                                                                                                                                                                                                                                           |
| NCHF             | Boardman River                                     | 165         | Manistee River           | 160                                               |             |             | <ul style="list-style-type: none"> <li>▪ <b>2 out of 2 watersheds</b></li> <li>▪ East Creek<sup>‡</sup> (170 mg/L) vs. Boardman River (165 mg/L)</li> <li>▪ Anderson Creek<sup>‡</sup> (206 mg/L) vs. Manistee River (160 mg/L) *</li> </ul> <p><sup>‡</sup> these Minimally Impacted Sites are located in the NLA ecoregion</p>                          |
| NLA              | Thunder Bay River                                  | 177         | Manistique River         | 89                                                |             |             |                                                                                                                                                                                                                                                                                                                                                           |
|                  | Muskegon River (Upper)                             | 161         | Ontonagon River          | 73                                                |             |             | ▪ <b>5 out of 11 watersheds</b> ; (3 of the 5 had significant differences*)                                                                                                                                                                                                                                                                               |
|                  | Cheboygan River                                    | 157         | Tahquamenon River        | 72                                                |             |             |                                                                                                                                                                                                                                                                                                                                                           |



| <b>Ecoregion</b>                                 | <b>Highest Median Concentrations at Main Sites</b> | <b>Site</b> | <b>mg/L</b> | <b>Lowest Median Concentrations at Main Sites</b> | <b>Site</b> | <b>mg/L</b> | <b>Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations?</b>                                                                                                                                                 |
|--------------------------------------------------|----------------------------------------------------|-------------|-------------|---------------------------------------------------|-------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Specific Conductance (units are in uS/cm)</b> |                                                    |             |             |                                                   |             |             |                                                                                                                                                                                                                                                                       |
| SMNIDP                                           | Grand River (Upper)                                |             | 663         | St. Joseph River (Upper)                          |             | 510         | <b>▪ 2 out of 8 watersheds</b><br>▪ Bellamy Creek (625 mg/L) vs. Grand River (Lower) (618 mg/L)<br>▪ South Branch Kalamazoo River (596 mg/L) vs. Kalamazoo River (Lower) (576 mg/L)                                                                                   |
|                                                  | Grand River (Lower)                                |             | 618         | Muskegon River (Lower)                            |             | 357         |                                                                                                                                                                                                                                                                       |
|                                                  | Kalamazoo River (Upper)                            |             | 615         | Pere Marquette River                              |             | 344         |                                                                                                                                                                                                                                                                       |
| HELP                                             | Huron River                                        |             | 950         | Tittabawassee River                               |             | 633         | <b>▪ 2 out of 10 watersheds</b><br>▪ Johnson Drain (1037 uS/cm) vs. River Rouge (530 uS/cm) *<br>▪ Black River (Headwaters) (817 uS/cm) vs. Black River (677 uS/cm) *                                                                                                 |
|                                                  | Clinton River                                      |             | 907         | River Raisin                                      |             | 618         |                                                                                                                                                                                                                                                                       |
|                                                  | Flint River                                        |             | 699         | River Rouge                                       |             | 530         |                                                                                                                                                                                                                                                                       |
| NCHF                                             | Manistee River                                     |             | 328         | Boardman River                                    |             | 326         | <b>▪ 2 out of 2 watersheds</b><br>▪ East Creek <sup>‡</sup> (341 uS/cm) vs. Boardman River (326 uS/cm)<br>▪ Anderson Creek <sup>‡</sup> (387 uS/cm) vs. Manistee River (328 uS/cm) *<br><sup>‡</sup> these Minimally Impacted Sites are located in the NLAF ecoregion |
|                                                  |                                                    |             |             |                                                   |             |             |                                                                                                                                                                                                                                                                       |
| NLAF                                             | Escanaba River                                     |             | 399         | Manistique River                                  |             | 182         | <b>▪ 4 out of 11 watersheds</b> ; (3 of the 4 had significant differences*)                                                                                                                                                                                           |
|                                                  | Thunder Bay River                                  |             | 352         | Ontonagon River                                   |             | 151         |                                                                                                                                                                                                                                                                       |
|                                                  | Muskegon River (Upper)                             |             | 331         | Tahquamenon River                                 |             | 149         |                                                                                                                                                                                                                                                                       |
| <b>Total Suspended Solids</b>                    |                                                    |             |             |                                                   |             |             |                                                                                                                                                                                                                                                                       |
| SMNIDP                                           | Grand River (Lower)                                |             | 24          | Pere Marquette River                              |             | 12          | <b>▪ 1 out of 8 watersheds</b><br>▪ Pokagon Creek (16 mg/L) vs. St. Joseph River (Upper) (6 mg/L)                                                                                                                                                                     |
|                                                  | Kalamazoo River (Lower)                            |             | 18          | Muskegon River (Lower)                            |             | 8           |                                                                                                                                                                                                                                                                       |
|                                                  | Grand River (Upper)                                |             | 15          | St. Joseph River (Upper)                          |             | 6           |                                                                                                                                                                                                                                                                       |
| HELP                                             | Flint River                                        |             | 25          | River Rouge                                       |             | 14          |                                                                                                                                                                                                                                                                       |
|                                                  | Cass River                                         |             | 21          | Tittabawassee River                               |             | 13          |                                                                                                                                                                                                                                                                       |
|                                                  | Clinton River                                      |             | 20          | River Raisin                                      |             | 11          |                                                                                                                                                                                                                                                                       |
| NCHF                                             | Manistee River                                     |             | 8           |                                                   |             |             |                                                                                                                                                                                                                                                                       |

| Ecoregion | Highest Median Concentrations at Main Sites |  | Lowest Median Concentrations at Main Sites |  | Any Instances Where Minimally Impacted Stations Had Higher |
|-----------|---------------------------------------------|--|--------------------------------------------|--|------------------------------------------------------------|
|-----------|---------------------------------------------|--|--------------------------------------------|--|------------------------------------------------------------|

**Appendix C-3.** Great Lakes tributary water quality (metals) data summary broken down by ecoregion. Refer to Appendix C-4 for more details.

\* = significant difference

| Ecoregion       | Highest Median Concentrations at Main Sites |        | Lowest Median Concentrations at Main Sites |       | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations?                     |
|-----------------|---------------------------------------------|--------|--------------------------------------------|-------|------------------------------------------------------------------------------------------------------------------------------------|
|                 | Site                                        | ug/L   | Site                                       | ug/L  |                                                                                                                                    |
| <b>Chromium</b> |                                             |        |                                            |       |                                                                                                                                    |
| SMNIDP          | Grand River (Lower)                         | 1.115  | Pere Marquette River                       | 0.433 | <b>▪ 1 out of 8 watersheds</b><br><b>▪ Pokagon Creek (0.320 mg/L) vs. St. Joseph River (Upper) (0.190 mg/L)</b>                    |
|                 | Kalamazoo River (Upper)                     | 1.110  | Muskegon River (Lower)                     | 0.281 |                                                                                                                                    |
|                 | Grand River (Upper)                         | 0.764  | St. Joseph River (Upper)                   | 0.190 |                                                                                                                                    |
| HELP            | Clinton River                               | 1.540  | Shiawassee River                           | 0.685 |                                                                                                                                    |
|                 | River Rouge                                 | 1.430  | Huron River                                | 0.556 |                                                                                                                                    |
|                 | Flint River                                 | 1.260  | Tittabawassee River                        | 0.537 |                                                                                                                                    |
| NCHF            | Manistee River                              | 0.300  | Boardman River                             | 0.231 | <b>▪ 1 out of 2 watersheds</b><br><b>▪ East Creek (located in the NLAF ecoregion) (0.263 ug/L) vs. Boardman River (0.231 ug/L)</b> |
| NLAF            | Pine River                                  | 1.410  | Cheboygan River                            | 0.110 | <b>▪ 4 out of 11 watersheds ; (2 of the 4 had significant differences*)</b>                                                        |
|                 | Ontonagon River                             | 1.150  | Thunder Bay River                          | 0.090 |                                                                                                                                    |
|                 | Escanaba River                              | 0.661  | Au Sable River                             | 0.080 |                                                                                                                                    |
| <b>Copper</b>   |                                             |        |                                            |       |                                                                                                                                    |
| SMNIDP          | Grand River (Upper)                         | 2.37   | Muskegon River (Lower)                     | 0.680 | <b>▪ 1 out of 8 watersheds</b><br><b>▪ Pokagon Creek (0.70 ug/L) vs. St. Joseph River (Upper) (0.67 ug/L)</b>                      |
|                 | Grand River (Lower)                         | 2.34   | St. Joseph River (Upper)                   | 0.670 |                                                                                                                                    |
|                 | St. Joseph River (Lower)                    | 1.52   | Pere Marquette River                       | 0.490 |                                                                                                                                    |
| HELP            | Clinton River                               | 3.67   | Tittabawassee River                        | 1.780 |                                                                                                                                    |
|                 | River Rouge                                 | 2.78   | Shiawassee River                           | 1.700 |                                                                                                                                    |
|                 | Flint River                                 | 2.58   | Huron River                                | 1.630 |                                                                                                                                    |
| NCHF            | Manistee River                              | 0.46   | Boardman River                             | 0.320 | <b>▪ 1 out of 2 watersheds</b><br><b>▪ East Creek (located in the NLAF ecoregion) (0.35 ug/L) vs. Boardman River (0.32 ug/L)</b>   |
| NLAF            | Ontonagon River                             | 3.27   | Thunder Bay River                          | 0.390 | <b>▪ 1 out of 11 watersheds</b><br><b>▪ Perry Creek (0.51 ug/L) vs. Au Sable River (0.25 ug/L) *</b>                               |
|                 | Pine River                                  | 1.26</ |                                            |       |                                                                                                                                    |

| Ecoregion                       | Highest Median Concentrations at Main Sites<br>Site ug/L | Lowest Median Concentrations at Main Sites<br>Site ug/L | Any Instances Where Minimally Impacted Stations Had Higher Medians Relative to their respective Main Stations? |       |                                                                                                                                                                                                                                                                 |
|---------------------------------|----------------------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------|-------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Lead</b>                     |                                                          |                                                         |                                                                                                                |       |                                                                                                                                                                                                                                                                 |
| SMNIDP                          | Kalamazoo River (Lower)                                  | 1.190                                                   | Pere Marquette River                                                                                           | 0.290 | <b>2 out of 8 watersheds</b><br>Bigelow Creek (located in the NLAf ecoregion) (0.261 ug/L) vs. Muskegon River (Lower) (0.148 ug/L)<br>Pokagon Creek (0.373 ug/L) vs. St. Joseph River (Upper) (0.264 ug/L) *                                                    |
|                                 | Grand River (Lower)                                      | 1.020                                                   | St. Joseph River (Upper)                                                                                       | 0.264 |                                                                                                                                                                                                                                                                 |
|                                 | Kalamazoo River (Upper)                                  | 0.984                                                   | Muskegon River (Lower)                                                                                         | 0.148 |                                                                                                                                                                                                                                                                 |
| HELP                            | River Rouge                                              | 2.060                                                   | Black River                                                                                                    | 0.549 |                                                                                                                                                                                                                                                                 |
|                                 | Clinton River                                            | 1.655                                                   | Shiawassee River                                                                                               | 0.546 |                                                                                                                                                                                                                                                                 |
|                                 | Flint River                                              | 1.470                                                   | Tittabawassee River                                                                                            | 0.363 |                                                                                                                                                                                                                                                                 |
| NCHF                            | Manistee River                                           | 0.164                                                   | Boardman River                                                                                                 | 0.078 |                                                                                                                                                                                                                                                                 |
| NLAf                            | Pine River                                               | 0.516                                                   | Thunder Bay River                                                                                              | 0.084 | <b>3 out of 11 watersheds</b><br>Pigeon River (0.066 ug/L) vs. Cheboygan River (0.038 ug/L)<br>Bigelow Creek (0.261 ug/L) vs. Muskegon River (Upper) (0.194 ug/L)<br>Perry Creek (0.068 ug/L) vs. Au Sable River (0.037 ug/L) *                                 |
|                                 | Ontonagon River                                          | 0.237                                                   | Cheboygan River                                                                                                | 0.038 |                                                                                                                                                                                                                                                                 |
|                                 | Muskegon River (Upper)                                   | 0.194                                                   | Au Sable River                                                                                                 | 0.037 |                                                                                                                                                                                                                                                                 |
| <b>Mercury (units are ng/L)</b> |                                                          |                                                         |                                                                                                                |       |                                                                                                                                                                                                                                                                 |
| SMNIDP                          | Kalamazoo River (Lower)                                  | 5.21                                                    | Pere Marquette River                                                                                           | 1.90  | <b>2 out of 8 watersheds</b><br>Bigelow Creek (located in the NLAf ecoregion) (1.31 ng/L) vs. Muskegon River (Lower) (1.10 ng/L)<br>Pokagon Creek (1.58 ng/L) vs. St. Joseph River (Upper) (1.36 ng/L)                                                          |
|                                 | Kalamazoo River (Upper)                                  | 4.23                                                    | St. Joseph River (Upper)                                                                                       | 1.36  |                                                                                                                                                                                                                                                                 |
|                                 | Grand River (Lower)                                      | 3.56                                                    | Muskegon River (Lower)                                                                                         | 1.10  |                                                                                                                                                                                                                                                                 |
| HELP                            | Clinton River                                            | 3.64                                                    | River Raisin                                                                                                   | 1.81  |                                                                                                                                                                                                                                                                 |
|                                 | River Rouge                                              | 3.30                                                    | Black River                                                                                                    | 1.64  |                                                                                                                                                                                                                                                                 |
|                                 | Flint River                                              | 3.16                                                    | Huron River                                                                                                    | 1.61  |                                                                                                                                                                                                                                                                 |
| NCHF                            | Manistee River                                           | 0.95                                                    | Boardman River                                                                                                 | 0.82  | <b>2 out of 2 watersheds</b><br>East Creek <sup>‡</sup> (1.15 ng/L) vs. Boardman River (0.82 ng/L)<br>Anderson Creek <sup>‡</sup> (1.96 ng/L) vs. Manistee River (0.95 ng/L) *<br><sup>‡</sup> these Minimally Impacted Sites are located in the NLAf ecoregion |
|                                 |                                                          |                                                         |                                                                                                                |       |                                                                                                                                                                                                                                                                 |
| NLAf                            | Pine River                                               | 4.14                                                    | Thunder Bay River                                                                                              | 0.62  | <b>2 out of 11 watersheds</b><br>Pigeon River (1.0                                                                                                                                                                                                              |

Appendix C-4. Summary of the comparisons between "Main" sites (i.e., "Integrator" and "Intensive" Sites) and their respective "Minimally Impacted Sites."

|              | Main Sites               |                         | Minimally Impacted Sites          |                         |  | Total Phosphorus (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|-------------------------|-----------------------------------|-------------------------|--|----------------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Eco-region Abbreviation | River Name                        | Eco-region Abbreviation |  | Median (Main)              | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | NL                      | East Branch Ontonagon             | NL                      |  | 0.040                      | 0.015           | YES                     | 0.025                                      |
| 2            | Menominee River          | NL                      | Paint River                       | NL                      |  | 0.028                      | 0.013           | YES                     | 0.015                                      |
| 3            | Escanaba River           | NL                      | Bryan Creek                       | NL                      |  | 0.037                      | 0.015           | YES                     | 0.022                                      |
| 4            | Sturgeon River           | NL                      | Eighteen Mile Creek               | NL                      |  | 0.019                      | 0.018           | YES                     | 0.001                                      |
| 5            | Manistique River         | NL                      | Fox River                         | NL                      |  | 0.018                      | 0.024           | no                      | -0.006                                     |
| 6            | Tahquamenon River        | NL                      | Tahquamenon River (Headwaters)    | NL                      |  | 0.022                      | 0.016           | YES                     | 0.006                                      |
| 7            | Pine River               | NL                      | Bear Creek                        | NL                      |  | 0.061                      | 0.033           | YES                     | 0.028                                      |
| 8            | Cheboygan River          | NL                      | Pigeon River                      | NL                      |  | 0.008                      | 0.015           | no                      | -0.007                                     |
| 9            | Boardman River           | NC                      | East Creek                        | NL                      |  | 0.010                      | 0.010           | same                    | 0.000                                      |
| 10           | Manistee River           | NC                      | Anderson Creek                    | NL                      |  | 0.020                      | 0.014           | YES                     | 0.006                                      |
| 11           | Pere Marquette River     | SM                      | Pere Marquette River (Headwaters) | NL                      |  | 0.033                      | 0.023           | YES                     | 0.010                                      |
| 12           | Muskegon River (Lower)   | SM                      | Bigelow Creek                     | NL                      |  | 0.027                      | 0.023           | YES                     | 0.004                                      |
| 13           | Muskegon River (Upper)   | NL                      | Bigelow Creek                     | NL                      |  | 0.030                      | 0.023           | YES                     | 0.007                                      |
| 14           | Grand River (Lower)      | SM                      | Bellamy Creek                     | SM                      |  | 0.107                      | 0.040           | YES                     | 0.067                                      |
| 15           | Grand River (Upper)      | SM                      | Grand River (Headwaters)          | SM                      |  | 0.109                      | 0.045           | YES                     | 0.064                                      |
| 16           | Kalamazoo River (Lower)  | SM                      | South Branch Kalamazoo River      | SM                      |  | 0.079                      | 0.028           | YES                     | 0.051                                      |
| 17           | Kalamazoo River (Upper)  | SM                      | South Branch Kalamazoo River      | SM                      |  | 0.058                      | 0.028           | YES                     | 0.030                                      |
| 18           | St. Joseph River (Lower) | SM                      | Coldwater River                   | SM                      |  | 0.065                      | 0.028           | YES                     | 0.037                                      |
| 19           | St. Joseph River (Upper) | SM                      | Pokagon Creek                     | SM                      |  | 0.034                      | 0.048           | no                      | -0.014                                     |
| 20           | River Raisin             | HE                      | River Raisin (Headwaters)         | SM                      |  | 0.067                      | 0.019           |                         |                                            |

|              | Main Sites               | Ortho Phosphate (mg/L) ** |                 |                         |                                            | Total Kjeldahl Nitrogen (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|---------------------------|-----------------|-------------------------|--------------------------------------------|-----------------------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)             | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)                     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 0.013                     | 0.007           | YES                     | 0.006                                      | 0.41                              | 0.24            | YES                     | 0.17                                       |
| 2            | Menominee River          | 0.006                     | 0.005           | YES                     | 0.001                                      | 0.48                              | 0.26            | YES                     | 0.22                                       |
| 3            | Escanaba River           | 0.010                     | 0.005           | YES                     | 0.005                                      | 0.63                              | 0.40            | YES                     | 0.23                                       |
| 4            | Sturgeon River           | 0.005                     | 0.005           | same                    | 0.000                                      | 0.53                              | 0.38            | YES                     | 0.15                                       |
| 5            | Manistique River         | 0.005                     | 0.008           | no                      | -0.003                                     | 0.43                              | 0.21            | YES                     | 0.22                                       |
| 6            | Tahquamenon River        | 0.005                     | 0.006           | no                      | -0.001                                     | 0.57                              | 0.14            | YES                     | 0.43                                       |
| 7            | Pine River               | 0.018                     | 0.008           | YES                     | 0.010                                      | 0.55                              | 0.51            | YES                     | 0.04                                       |
| 8            | Cheboygan River          | 0.005                     | 0.002           | YES                     | 0.003                                      | 0.28                              | 0.28            | same                    | 0.00                                       |
| 9            | Boardman River           | 0.005                     | 0.004           | YES                     | 0.001                                      | 0.18                              | 0.26            | no                      | -0.08                                      |
| 10           | Manistee River           | 0.005                     | 0.005           | same                    | 0.000                                      | 0.23                              | 0.37            | no                      | -0.14                                      |
| 11           | Pere Marquette River     | 0.010                     | 0.006           | YES                     | 0.004                                      | 0.36                              | 0.27            | YES                     | 0.09                                       |
| 12           | Muskegon River (Lower)   | 0.007                     | 0.005           | YES                     | 0.002                                      | 0.41                              | 0.27            | YES                     | 0.14                                       |
| 13           | Muskegon River (Upper)   | 0.007                     | 0.005           | YES                     | 0.002                                      | 0.43                              | 0.27            | YES                     | 0.16                                       |
| 14           | Grand River (Lower)      | 0.026                     | 0.020           | YES                     | 0.006                                      | 1.00                              | 0.49            | YES                     | 0.51                                       |
| 15           | Grand River (Upper)      | 0.040                     | 0.005           | YES                     | 0.035                                      | 0.94                              | 0.71            | YES                     | 0.23                                       |
| 16           | Kalamazoo River (Lower)  | 0.012                     | 0.005           | YES                     | 0.007                                      | 0.80                              | 0.48            | YES                     | 0.32                                       |
| 17           | Kalamazoo River (Upper)  | 0.014                     | 0.005           | YES                     | 0.009                                      | 0.62                              | 0.48            | YES                     | 0.14                                       |
| 18           | St. Joseph River (Lower) | 0.013                     | 0.005           | YES                     | 0.008                                      | 0.61                              | 0.53            | YES                     | 0.08                                       |
| 19           | St. Joseph River (Upper) | 0.006                     | 0.012           | no                      | -0.006                                     | 0.54                              | 0.60            | no                      | -0.06                                      |
| 20           | River Raisin             |                           |                 |                         |                                            |                                   |                 |                         |                                            |

|              | Main Sites               | Nitrate (mg/L) ** |                 |                         |                                            | Nitrite (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 0.01              | 0.07            | no                      | -0.06                                      | 0.010             | 0.006           | YES                     | 0.004                                      |
| 2            | Menominee River          | 0.05              | 0.06            | no                      | -0.01                                      | 0.010             | 0.006           | YES                     | 0.004                                      |
| 3            | Escanaba River           | 0.11              | 0.03            | YES                     | 0.08                                       | 0.012             | 0.006           | YES                     | 0.006                                      |
| 4            | Sturgeon River           | 0.06              | 0.01            | YES                     | 0.05                                       | 0.006             | 0.006           | same                    | 0.000                                      |
| 5            | Manistique River         | 0.05              | 0.08            | no                      | -0.03                                      | 0.010             | 0.006           | YES                     | 0.004                                      |
| 6            | Tahquamenon River        | 0.07              | 0.06            | YES                     | 0.01                                       | 0.010             | 0.006           | YES                     | 0.004                                      |
| 7            | Pine River               | 0.02              | 0.01            | YES                     | 0.01                                       | 0.010             | 0.006           | YES                     | 0.004                                      |
| 8            | Cheboygan River          | 0.02              | 0.04            | no                      | -0.02                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 9            | Boardman River           | 0.20              | 0.77            | no                      | -0.57                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 10           | Manistee River           | 0.15              | 0.76            | no                      | -0.61                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 11           | Pere Marquette River     | 0.11              | 0.05            | YES                     | 0.06                                       | 0.010             | 0.006           | YES                     | 0.004                                      |
| 12           | Muskegon River (Lower)   | 0.30              | 0.12            | YES                     | 0.18                                       | 0.010             | 0.006           | YES                     | 0.004                                      |
| 13           | Muskegon River (Upper)   | 0.20              | 0.12            | YES                     | 0.08                                       | 0.010             | 0.006           | YES                     | 0.004                                      |
| 14           | Grand River (Lower)      | 1.49              | 2.65            | no                      | -1.16                                      | 0.029             | 0.011           | YES                     | 0.018                                      |
| 15           | Grand River (Upper)      | 1.78              | 0.37            | YES                     | 1.41                                       | 0.020             | 0.006           | YES                     | 0.014                                      |
| 16           | Kalamazoo River (Lower)  | 1.03              | 2.05            | no                      | -1.02                                      | 0.019             | 0.010           | YES                     | 0.009                                      |
| 17           | Kalamazoo River (Upper)  | 0.99              | 2.05            | no                      | -1.06                                      | 0.011             | 0.010           | YES                     | 0.001                                      |
| 18           | St. Joseph River (Lower) | 1.49              | 0.84            | YES                     | 0.65                                       | 0.013             | 0.006           | YES                     | 0.007                                      |
| 19           | St. Joseph River (Upper) | 1.32              | 2.40            | no                      | -1.08                                      | 0.015             | 0.011           | YES                     | 0.004                                      |
| 20           |                          |                   |                 |                         |                                            |                   |                 |                         |                                            |

|              | Main Sites               | Ammonia (NH <sub>3</sub> ) (mg/L) ** |                 |                         |                                            | Turbidity (NTU) ** |                 |                         |                                            |
|--------------|--------------------------|--------------------------------------|-----------------|-------------------------|--------------------------------------------|--------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)                        | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)      | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 0.010                                | 0.006           | YES                     | 0.004                                      | 22.0               | 3.7             | YES                     | 18.3                                       |
| 2            | Menominee River          | 0.011                                | 0.010           | YES                     | 0.001                                      | 2.7                | 1.4             | YES                     | 1.3                                        |
| 3            | Escanaba River           | 0.059                                | 0.013           | YES                     | 0.046                                      | 4.1                | 2.4             | YES                     | 1.7                                        |
| 4            | Sturgeon River           | 0.017                                | 0.006           | YES                     | 0.011                                      | 4.7                | 1.8             | YES                     | 2.9                                        |
| 5            | Manistique River         | 0.017                                | 0.006           | YES                     | 0.011                                      | 5.1                | 2.5             | YES                     | 2.6                                        |
| 6            | Tahquamenon River        | 0.015                                | 0.006           | YES                     | 0.009                                      | 3.8                | 0.5             | YES                     | 3.3                                        |
| 7            | Pine River               | 0.016                                | 0.017           | no                      | -0.001                                     | 29.0               | 9.1             | YES                     | 19.9                                       |
| 8            | Cheboygan River          | 0.015                                | 0.010           | YES                     | 0.005                                      | 1.0                | 2.1             | no                      | -1.1                                       |
| 9            | Boardman River           | 0.010                                | 0.006           | YES                     | 0.004                                      | 1.6                | 1.4             | YES                     | 0.2                                        |
| 10           | Manistee River           | 0.018                                | 0.009           | YES                     | 0.009                                      | 4.6                | 2.2             | YES                     | 2.4                                        |
| 11           | Pere Marquette River     | 0.018                                | 0.012           | YES                     | 0.006                                      | 5.6                | 2.3             | YES                     | 3.3                                        |
| 12           | Muskegon River (Lower)   | 0.021                                | 0.017           | YES                     | 0.004                                      | 3.0                | 3.3             | no                      | -0.3                                       |
| 13           | Muskegon River (Upper)   | 0.014                                | 0.017           | no                      | -0.003                                     | 4.6                | 3.3             | YES                     | 1.3                                        |
| 14           | Grand River (Lower)      | 0.063                                | 0.001           | YES                     | 0.062                                      | 12.0               | 2.7             | YES                     | 9.3                                        |
| 15           | Grand River (Upper)      | 0.029                                | 0.035           | no                      | -0.006                                     | 10.0               | 5.9             | YES                     | 4.1                                        |
| 16           | Kalamazoo River (Lower)  | 0.036                                | 0.018           | YES                     | 0.018                                      | 11.9               | 7.2             | YES                     | 4.7                                        |
| 17           | Kalamazoo River (Upper)  | 0.038                                | 0.018           | YES                     | 0.020                                      | 6.3                | 7.2             | no                      | -0.9                                       |
| 18           | St. Joseph River (Lower) | 0.014                                | 0.018           | no                      | -0.004                                     | 7.4                | 2.5             | YES                     | 4.9                                        |
| 19           | St. Joseph River (Upper) | 0.044                                | 0.023           | YES                     | 0.021                                      | 3.8                | 5.5             | no                      | -1.7                                       |
| 20           | River Raisin             | 0.019                                | 0.021           | no                      | -0.002</                                   |                    |                 |                         |                                            |



|              | Main Sites               | Alkalinity (mg/L) ** |                 |                         |                                            | Total Suspended Solids (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|----------------------|-----------------|-------------------------|--------------------------------------------|----------------------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)        | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)                    | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 58                   | 54              | YES                     | 4.0                                        | 14                               | 4               | YES                     | 10                                         |
| 2            | Menominee River          | 101                  | 61              | YES                     | 40.0                                       | 4                                | 2               | YES                     | 2                                          |
| 3            | Escanaba River           | 129                  | 107             | YES                     | 22.0                                       | 4                                | 4               | same                    | 0                                          |
| 4            | Sturgeon River           | 65                   | 85              | no                      | -20.0                                      | 4                                | 4               | same                    | 0                                          |
| 5            | Manistique River         | 61                   | 46              | YES                     | 15.0                                       | 5                                | 4               | YES                     | 1                                          |
| 6            | Tahquamenon River        | 53                   | 58              | no                      | -5.0                                       | 4                                | 5               | no                      | -1                                         |
| 7            | Pine River               | 81                   | 85              | no                      | -4.0                                       | 21                               | 11              | YES                     | 10                                         |
| 8            | Cheboygan River          | 138                  | 186             | no                      | -48.0                                      | 4                                | 5               | no                      | -1                                         |
| 9            | Boardman River           | 145                  | 148             | no                      | -3.0                                       | 4                                | 4               | same                    | 0                                          |
| 10           | Manistee River           | 137                  | 178             | no                      | -41.0                                      | 8                                | 3               | YES                     | 5                                          |
| 11           | Pere Marquette River     | 138                  | 137             | YES                     | 1.0                                        | 12                               | 6               | YES                     | 6                                          |
| 12           | Muskegon River (Lower)   | 135                  | 137             | no                      | -2.0                                       | 8                                | 8               | same                    | 0                                          |
| 13           | Muskegon River (Upper)   | 134                  | 137             | no                      | -3.0                                       | 10                               | 8               | YES                     | 2                                          |
| 14           | Grand River (Lower)      | 190                  | 273             | no                      | -83.0                                      | 24                               | 4               | YES                     | 20                                         |
| 15           | Grand River (Upper)      | 210                  | 232             | no                      | -22.0                                      | 15                               | 9               | YES                     | 6                                          |
| 16           | Kalamazoo River (Lower)  | 192                  | 245             | no                      | -53.0                                      | 18                               | 12              | YES                     | 6                                          |
| 17           | Kalamazoo River (Upper)  | 227                  | 245             | no                      | -18.0                                      | 12                               | 12              | same                    | 0                                          |
| 18           | St. Joseph River (Lower) | 209                  | 181             | YES                     | 28.0                                       | 15                               | 4               | YES                     | 11                                         |
| 19           | St. Joseph River (Upper) | 198                  | 222             | no                      | -24.0                                      | 6                                | 16              | no                      | -10                                        |
| 20           | River Raisin             | 178                  | 186             | no                      | -8.0                                       | 11                               | 5               | YES                     | 6                                          |
| 21           | Huron River              | 183                  | 180             | YES                     | 3.0                                        | 14                               | 7               | YES                     | 7                                          |
| 22           | River Rouge              | 98                   | 279             | no                      | -181.0                                     | 14                               | 14              | same                    | 0                                          |
| 23           | Clinton River            | 172                  | 304             | no                      | -132.0                                     | 20                               | 4               | YES                     | 16                                         |
| 24           | Black River              | 216                  | 238             | no                      | -22.0                                      | 18                               | 9               | YES                     | 9                                          |
| 25           | Flint River              | 184                  | 242             | no                      | -58.0                                      | 25                               | 5               | YES                     | 20                                         |
| 26           | Cass River               | 210                  | 190             | YES                     | 20.0                                       | 21                               | 5               | YES                     | 16                                         |
| 27           | Shiawassee River         | 212                  | 244             | no                      | -32.0                                      | 17                               | 3               | YES                     | 14                                         |
| 28           | Tittabawassee River      | 159                  | 168             | no                      | -9.0                                       | 13                               | 7               | YES                     | 6                                          |
| 29           | Saginaw River            | 170                  | --              | --                      | --                                         | 18                               | --              | --                      | --                                         |
| 30           | Au Sable River           | 131                  | 183             | no                      | -52.0                                      | 4                                | 4               | same                    | 0                                          |
| 31           | Thunder Bay River        | 163                  | 174             | no                      | -11.0                                      | 4                                | 5               | no                      | -1                                         |
|              |                          |                      |                 |                         |                                            |                                  |                 |                         |                                            |
|              | Summary Stat I:          |                      |                 | 8                       | 27%                                        |                                  |                 | 19                      | 63%                                        |
|              | Summary Stat II:         |                      |                 | 0                       | 0%                                         |                                  |                 | 7                       | 23%                                        |
|              | Summary Stat III:        |                      |                 | 22                      | 73%                                        |                                  |                 | 4                       | 13%                                        |

|              | Main Sites               | Total Organic Carbon (mg/L) ** |                 |                         |                                            | Calcium (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|--------------------------------|-----------------|-------------------------|--------------------------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)                  | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 9.1                            | 6.5             | YES                     | 2.6                                        | 20.2              | 18.1            | YES                     | 2.1                                        |
| 2            | Menominee River          | 10.0                           | 5.6             | YES                     | 4.4                                        | 27.2              | 19.0            | YES                     | 8.2                                        |
| 3            | Escanaba River           | 19.0                           | 7.1             | YES                     | 11.9                                       | 29.0              | 29.5            | no                      | -0.5                                       |
| 4            | Sturgeon River           | 15.0                           | 10.5            | YES                     | 4.5                                        | 32.2              | 25.6            | YES                     | 6.6                                        |
| 5            | Manistique River         | 9.6                            | 4.1             | YES                     | 5.5                                        | 26.0              | 15.3            | YES                     | 10.7                                       |
| 6            | Tahquamenon River        | 16.0                           | 1.5             | YES                     | 14.5                                       | 20.3              | 20.6            | no                      | -0.3                                       |
| 7            | Pine River               | 14.0                           | 15.0            | no                      | -1.0                                       | 25.2              | 28.9            | no                      | -3.7                                       |
| 8            | Cheboygan River          | 5.0                            | 4.3             | YES                     | 0.7                                        | 40.8              | 56.2            | no                      | -15.4                                      |
| 9            | Boardman River           | 2.9                            | 3.6             | no                      | -0.7                                       | 47.2              | 48.1            | no                      | -0.9                                       |
| 10           | Manistee River           | 3.4                            | 6.7             | no                      | -3.3                                       | 43.8              | 61.0            | no                      | -17.2                                      |
| 11           | Pere Marquette River     | 4.1                            | 3.6             | YES                     | 0.5                                        | 42.9              | 39.5            | YES                     | 3.4                                        |
| 12           | Muskegon River (Lower)   | 6.2                            | 3.2             | YES                     | 3.0                                        | 43.2              | 40.2            | YES                     | 3.0                                        |
| 13           | Muskegon River (Upper)   | 6.9                            | 3.2             | YES                     | 3.7                                        | 42.5              | 40.2            | YES                     | 2.3                                        |
| 14           | Grand River (Lower)      | 7.4                            | 6.4             | YES                     | 1.0                                        | 66.6              | 81.9            | no                      | -15.3                                      |
| 15           | Grand River (Upper)      | 8.7                            | 5.9             | YES                     | 2.8                                        | 75.5              | 70.9            | YES                     | 4.6                                        |
| 16           | Kalamazoo River (Lower)  | 6.2                            | 4.2             | YES                     | 2.0                                        | 62.7              | 79.7            | no                      | -17.0                                      |
| 17           | Kalamazoo River (Upper)  | 6.0                            | 4.2             | YES                     | 1.8                                        | 75.2              | 79.7            | no                      | -4.5                                       |
| 18           | St. Joseph River (Lower) | 5.1                            | 6.3             | no                      | -1.2                                       | 68.9              | 63.8            | YES                     | 5.1                                        |
| 19           | St. Joseph River (Upper) | 5.4                            | 4.4             | YES                     | 1.0                                        | 66.6              | 63.4            | YES                     | 3.2                                        |
| 20           | River Raisin             | 6.2                            | 6.7             | no                      | -0.5                                       | 72.9              | 58.4            | YES                     | 14.5                                       |
| 21           | Huron River              | 6.7                            | 5.9             | YES                     | 0.8                                        | 97.5              | 64.5            | YES                     | 33.0                                       |
| 22           | River Rouge              | 3.7                            | 5.1             | no                      | -1.4                                       | 42.8              | 97.6            | no                      | -54.8                                      |
| 23           | Clinton River            | 6.9                            | 4.3             | YES                     | 2.6                                        | 67.6              | 89.2            | no                      | -21.6                                      |
| 24           | Black River              | 8.6                            | 8.2             | YES                     | 0.4                                        | 75.4              | 78.0            | no                      | -2.6                                       |
| 25           | Flint River              | 8.2                            | 6.9             | YES                     | 1.3                                        | 63.0              | 71.1            | no                      | -8.1                                       |
| 26           | Cass River               | 8.6                            | 6.7             | YES                     | 1.9                                        | 74.9              | 61.0            | YES                     | 13.9                                       |
| 27           | Shiawassee River         | 7.1                            | 4.8             | YES                     | 2.3                                        | 65.7              | 65.5            | YES                     | 0.2                                        |
| 28           | Tittabawassee River      | 7.8                            | 3.1             | YES                     | 4.7                                        | 59.3              | 49.9            | YES                     | 9.4                                        |
| 29           | Saginaw River            | 8.2                            | --              | --                      | --                                         | 61.7              | --              | --                      | --                                         |
| 30           | Au Sable River           | 3.5                            | 4.4             | no                      | -0.9                                       | 41.1              | 56.5            | no                      | -15.4                                      |
| 31           | Thunder Bay River        | 7.9                            | 4.1             | YES                     | 3.8                                        | 48.5              | 51.5            | no                      | -3.0                                       |
|              |                          |                                |                 |                         |                                            |                   |                 |                         |                                            |
|              | Summary Stat I:          |                                |                 | 23                      | 77%                                        |                   |                 | 15                      | 50%                                        |
|              | Summary Stat II:         |                                |                 | 0                       | 0%                                         |                   |                 | 0                       | 0%                                         |
|              | Summary Stat III:        |                                |                 | 7                       | 23%                                        |                   |                 | 15                      | 50%                                        |

|              | Main Sites               | Magnesium (mg/L) ** |                 |                         |                                            | Potassium (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|---------------------|-----------------|-------------------------|--------------------------------------------|---------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)       | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)       | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 5.6                 | 4.9             | YES                     | 0.7                                        | 1.2                 | 0.8             | YES                     | 0.4                                        |
| 2            | Menominee River          | 12.4                | 6.0             | YES                     | 6.4                                        | 1.5                 | 0.7             | YES                     | 0.8                                        |
| 3            | Escanaba River           | 10.5                | 12.8            | no                      | -2.3                                       | 2.7                 | 0.7             | YES                     | 2.0                                        |
| 4            | Sturgeon River           | 6.9                 | 8.5             | no                      | -1.6                                       | 0.7                 | 0.7             | same                    | 0.0                                        |
| 5            | Manistique River         | 5.9                 | 4.3             | YES                     | 1.6                                        | 0.6                 | 0.7             | no                      | -0.1                                       |
| 6            | Tahquamenon River        | 5.2                 | 5.0             | YES                     | 0.2                                        | 0.7                 | 0.7             | same                    | 0.0                                        |
| 7            | Pine River               | 8.8                 | 10.0            | no                      | -1.2                                       | 1.0                 | 0.8             | YES                     | 0.2                                        |
| 8            | Cheboygan River          | 13.3                | 15.0            | no                      | -1.7                                       | 0.8                 | 0.7             | YES                     | 0.1                                        |
| 9            | Boardman River           | 11.2                | 11.8            | no                      | -0.6                                       | 0.7                 | 0.9             | no                      | -0.2                                       |
| 10           | Manistee River           | 12.1                | 12.8            | no                      | -0.7                                       | 0.7                 | 1.0             | no                      | -0.3                                       |
| 11           | Pere Marquette River     | 14.4                | 14.3            | YES                     | 0.1                                        | 0.8                 | 0.6             | YES                     | 0.2                                        |
| 12           | Muskegon River (Lower)   | 13.6                | 14.1            | no                      | -0.5                                       | 1.2                 | 0.8             | YES                     | 0.4                                        |
| 13           | Muskegon River (Upper)   | 12.7                | 14.1            | no                      | -1.4                                       | 1.1                 | 0.8             | YES                     | 0.3                                        |
| 14           | Grand River (Lower)      | 22.0                | 27.9            | no                      | -5.9                                       | 3.3                 | 2.9             | YES                     | 0.4                                        |
| 15           | Grand River (Upper)      | 23.8                | 23.5            | YES                     | 0.3                                        | 3.6                 | 1.3             | YES                     | 2.3                                        |
| 16           | Kalamazoo River (Lower)  | 21.5                | 23.7            | no                      | -2.2                                       | 2.7                 | 1.3             | YES                     | 1.4                                        |
| 17           | Kalamazoo River (Upper)  | 21.9                | 23.7            | no                      | -1.8                                       | 1.9                 | 1.3             | YES                     | 0.6                                        |
| 18           | St. Joseph River (Lower) | 22.1                | 20.1            | YES                     | 2.0                                        | 2.3                 | 2.4             | no                      | -0.1                                       |
| 19           | St. Joseph River (Upper) | 20.3                | 24.5            | no                      | -4.2                                       | 1.8                 | 1.4             | YES                     | 0.4                                        |
| 20           | River Raisin             | 20.8                | 19.5            | YES                     | 1.3                                        | 3.6                 | 1.6             | YES                     | 2.0                                        |
| 21           | Huron River              | 26.0                | 23.8            | YES                     | 2.2                                        | 3.3                 | 3.0             | YES                     | 0.3                                        |
| 22           | River Rouge              | 11.0                | 25.7            | no                      | -14.7                                      | 6.4                 | 4.3             | YES                     | 2.1                                        |
| 23           | Clinton River            | 19.8                | 32.0            | no                      | -12.2                                      | 4.5                 | 1.8             | YES                     | 2.7                                        |
| 24           | Black River              | 26.5                | 31.0            | no                      | -4.5                                       | 4.0                 | 4.5             | no                      | -0.5                                       |
| 25           | Flint River              | 22.5                | 27.5            | no                      | -5.0                                       | 4.2                 | 1.9             | YES                     | 2.3                                        |
| 26           | Cass River               | 24.2                | 20.2            | YES                     | 4.0                                        | 4.4                 | 2.8             | YES                     | 1.6                                        |
| 27           | Shiawassee River         | 24.9                | 25.5            | no                      | -0.6                                       | 3.8                 | 1.6             | YES                     | 2.2                                        |
| 28           | Tittabawassee River      | 18.0                | 15.0            | YES                     | 3.0                                        | 2.8                 | 0.7             | YES                     | 2.1                                        |
| 29           | Saginaw River            | 19.8                | --              | --                      | --                                         | 3.9                 | --              | --                      | --                                         |
| 30           | Au Sable River           | 10.9                | 13.9            | no                      | -3.0                                       | 0.6                 | 1.5             | no                      | -0.9                                       |
| 31           | Thunder Bay River        | 14.5                | 15.0            | no                      | -0.5                                       | 0.8                 | 0.6             | YES                     | 0.2                                        |
|              |                          |                     |                 |                         |                                            |                     |                 |                         |                                            |
|              | Summary Stat I:          |                     |                 | 11                      | 37%                                        |                     |                 | 22                      | 73%                                        |
|              | Summary Stat II:         |                     |                 | 0                       | 0%                                         |                     |                 | 2                       | 7%                                         |
|              | Summary Stat III:        |                     |                 | 19                      | 63%                                        |                     |                 | 6                       | 20%                                        |

|              | Main Sites               | Sodium (mg/L) ** |                 |                         |                                            | Chloride (mg/L) ** |                 |                         |                                            |
|--------------|--------------------------|------------------|-----------------|-------------------------|--------------------------------------------|--------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)    | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)      | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 3.0              | 2.1             | YES                     | 0.9                                        | 3.0                | 1.1             | YES                     | 1.9                                        |
| 2            | Menominee River          | 8.9              | 2.1             | YES                     | 6.8                                        | 7.3                | 1.9             | YES                     | 5.4                                        |
| 3            | Escanaba River           | 45.2             | 1.0             | YES                     | 44.2                                       | 21.0               | 1.0             | YES                     | 20.0                                       |
| 4            | Sturgeon River           | 1.7              | 1.7             | same                    | 0.0                                        | 2.0                | 2.9             | no                      | -0.9                                       |
| 5            | Manistique River         | 1.9              | 0.8             | YES                     | 1.1                                        | 2.0                | 1.0             | YES                     | 1.0                                        |
| 6            | Tahquamenon River        | 2.0              | 1.1             | YES                     | 0.9                                        | 2.0                | 1.0             | YES                     | 1.0                                        |
| 7            | Pine River               | 2.5              | 1.8             | YES                     | 0.7                                        | 3.0                | 2.0             | YES                     | 1.0                                        |
| 8            | Cheboygan River          | 5.9              | 4.0             | YES                     | 1.9                                        | 8.0                | 5.0             | YES                     | 3.0                                        |
| 9            | Boardman River           | 5.2              | 5.3             | no                      | -0.1                                       | 8.0                | 9.0             | no                      | -1.0                                       |
| 10           | Manistee River           | 7.0              | 4.3             | YES                     | 2.7                                        | 12.0               | 10.0            | YES                     | 2.0                                        |
| 11           | Pere Marquette River     | 7.9              | 5.2             | YES                     | 2.7                                        | 13.0               | 7.0             | YES                     | 6.0                                        |
| 12           | Muskegon River (Lower)   | 10.5             | 5.5             | YES                     | 5.0                                        | 18.9               | 9.0             | YES                     | 9.9                                        |
| 13           | Muskegon River (Upper)   | 9.7              | 5.5             | YES                     | 4.2                                        | 16.0               | 9.0             | YES                     | 7.0                                        |
| 14           | Grand River (Lower)      | 28.0             | 8.5             | YES                     | 19.5                                       | 51.0               | 28.0            | YES                     | 23.0                                       |
| 15           | Grand River (Upper)      | 25.6             | 9.8             | YES                     | 15.8                                       | 48.0               | 23.0            | YES                     | 25.0                                       |
| 16           | Kalamazoo River (Lower)  | 23.4             | 7.5             | YES                     | 15.9                                       | 42.0               | 25.5            | YES                     | 16.5                                       |
| 17           | Kalamazoo River (Upper)  | 19.5             | 7.5             | YES                     | 12.0                                       | 39.0               | 25.5            | YES                     | 13.5                                       |
| 18           | St. Joseph River (Lower) | 16.3             | 14.6            | YES                     | 1.7                                        | 31.0               | 32.5            | no                      | -1.5                                       |
| 19           | St. Joseph River (Upper) | 10.4             | 5.4             | YES                     | 5.0                                        | 23.1               | 10.0            | YES                     | 13.1                                       |
| 20           | River Raisin             | 21.7             | 13.4            | YES                     | 8.3                                        | 44.2               | 28.0            | YES                     | 16.2                                       |
| 21           | Huron River              | 50.8             | 65.7            | no                      | -14.9                                      | 97.0               | 120.0           | no                      | -23.0                                      |
| 22           | River Rouge              | 42.6             | 71.8            | no                      | -29.2                                      | 80.0               | 151.0           | no                      | -71.0                                      |
| 23           | Clinton River            | 88.0             | 8.9             | YES                     | 79.1                                       | 151.0              | 27.5            | YES                     | 123.5                                      |
| 24           | Black River              | 27.0             | 38.5            | no                      | -11.5                                      | 51.0               | 75.5            | no                      | -24.5                                      |
| 25           | Flint River              | 45.5             | 12.9            | YES                     | 32.6                                       | 83.0               | 34.0            | YES                     | 49.0                                       |
| 26           | Cass River               | 18.0             | 7.8             | YES                     | 10.2                                       | 40.0               | 18.0            | YES                     | 22.0                                       |
| 27           | Shiawassee River         | 38.1             | 23.3            | YES                     | 14.8                                       | 72.0               | 50.5            | YES                     | 21.5                                       |
| 28           | Tittabawassee River      | 49.0             | 4.5             | YES                     | 44.5                                       | 85.0               | 2.5             | YES                     | 82.5                                       |
| 29           | Saginaw River            | 39.5             | --              | --                      | --                                         | 72.0               | --              | --                      | --                                         |
| 30           | Au Sable River           | 5.1              | 8.6             | no                      | -3.5                                       | 6.0                | 13.0            | no                      | -7.0                                       |
| 31           | Thunder Bay River        | 6.0              | 5.1             | YES                     | 0.9                                        | 7.0                | 6.0             | YES                     | 1.0                                        |
|              |                          |                  |                 |                         |                                            |                    |                 |                         |                                            |
|              | Summary Stat I:          |                  |                 | 24                      | 80%                                        |                    |                 | 23                      | 77%                                        |
|              | Summary Stat II:         |                  |                 | 1                       | 3%                                         |                    |                 | 0                       | 0%                                         |
|              | Summary Stat III:        |                  |                 | 5                       | 17%                                        |                    |                 | 7                       | 23%                                        |

|              | Main Sites               | Sulfate (mg/L) ** |                 |                         |                                            | Lead (ug/L) ** |                 |                         |                                            |
|--------------|--------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|----------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)  | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 4                 | 6               | no                      | -2.0                                       | 0.237          | 0.054           | YES                     | 0.183                                      |
| 2            | Menominee River          | 16                | 6               | YES                     | 10.0                                       | 0.125          | 0.044           | YES                     | 0.081                                      |
| 3            | Escanaba River           | 40                | 8               | YES                     | 32.0                                       | 0.159          | 0.063           | YES                     | 0.096                                      |
| 4            | Sturgeon River           | 27                | 10              | YES                     | 17.0                                       | 0.167          | 0.095           | YES                     | 0.072                                      |
| 5            | Manistique River         | 17                | 3               | YES                     | 14.0                                       | 0.156          | 0.092           | YES                     | 0.064                                      |
| 6            | Tahquamenon River        | 9                 | 4               | YES                     | 5.0                                        | 0.191          | 0.045           | YES                     | 0.146                                      |
| 7            | Pine River               | 6                 | 8               | no                      | -2.0                                       | 0.516          | 0.222           | YES                     | 0.294                                      |
| 8            | Cheboygan River          | 7                 | 4               | YES                     | 3.0                                        | 0.038          | 0.066           | no                      | -0.028                                     |
| 9            | Boardman River           | 6                 | 8               | no                      | -2.0                                       | 0.078          | 0.078           | same                    | 0.000                                      |
| 10           | Manistee River           | 9                 | 11              | no                      | -2.0                                       | 0.164          | 0.117           | YES                     | 0.047                                      |
| 11           | Pere Marquette River     | 14                | 6               | YES                     | 8.0                                        | 0.290          | 0.173           | YES                     | 0.117                                      |
| 12           | Muskegon River (Lower)   | 13                | 12              | YES                     | 1.0                                        | 0.148          | 0.261           | no                      | -0.113                                     |
| 13           | Muskegon River (Upper)   | 7                 | 12              | no                      | -5.0                                       | 0.194          | 0.261           | no                      | -0.067                                     |
| 14           | Grand River (Lower)      | 42                | 30              | YES                     | 12.0                                       | 1.020          | 0.107           | YES                     | 0.913                                      |
| 15           | Grand River (Upper)      | 43                | 22              | YES                     | 21.0                                       | 0.796          | 0.376           | YES                     | 0.420                                      |
| 16           | Kalamazoo River (Lower)  | 32                | 32              | same                    | 0.0                                        | 1.190          | 0.293           | YES                     | 0.897                                      |
| 17           | Kalamazoo River (Upper)  | 32                | 32              | same                    | 0.0                                        | 0.984          | 0.293           | YES                     | 0.691                                      |
| 18           | St. Joseph River (Lower) | 37                | 36              | YES                     | 1.0                                        | 0.709          | 0.119           | YES                     | 0.590                                      |
| 19           | St. Joseph River (Upper) | 33                | 24              | YES                     | 9.0                                        | 0.264          | 0.373           | no                      | -0.109                                     |
| 20           | River Raisin             | 48                | 25              | YES                     | 23.0                                       | 0.566          | 0.119           | YES                     | 0.447                                      |
| 21           | Huron River              | 121               | 36              | YES                     | 85.0                                       | 1.435          | 0.291           | YES                     | 1.144                                      |
| 22           | River Rouge              | 26                | 38              | no                      | -12.0                                      | 2.060          | 1.040           | YES                     | 1.020                                      |
| 23           | Clinton River            | 34                | 29              | YES                     | 5.0                                        | 1.655          | 0.107           | YES                     | 1.548                                      |
| 24           | Black River              | 64                | 78              | no                      | -14.0                                      | 0.549          | 0.308           | YES                     | 0.241                                      |
| 25           | Flint River              | 33                | 26              | YES                     | 7.0                                        | 1.470          | 0.130           | YES                     | 1.340                                      |
| 26           | Cass River               | 50                | 34              | YES                     | 16.0                                       | 0.608          | 0.146           | YES                     | 0.462                                      |
| 27           | Shiawassee River         | 31                | 10              | YES                     | 21.0                                       | 0.546          | 0.033           | YES                     | 0.513                                      |
| 28           | Tittabawassee River      | 32                | 16              | YES                     | 16.0                                       | 0.363          | 0.102           | YES                     | 0.261                                      |
| 29           | Saginaw River            | 32                | --              | --                      | --                                         | 0.952          | --              | --                      | --                                         |
| 30           | Au Sable River           | 6                 | 9               | no                      | -3.0                                       | 0.037          | 0.068           | no                      | -0.031                                     |
| 31           | Thunder Bay River        | 6                 | 4               | YES                     | 2.0                                        | 0.084          | 0.044           | YES                     | 0.040                                      |
|              |                          |                   |                 |                         |                                            |                |                 |                         |                                            |
|              | Summary Stat I:          |                   |                 | 20                      | 67%                                        |                |                 | 24                      | 80%                                        |
|              | Summary Stat II:         |                   |                 | 2                       | 7%                                         |                |                 | 1                       | 3%                                         |
|              | Summary Stat III:        |                   |                 | 8                       | 27%                                        |                |                 | 5                       | 17%                                        |

|              | Main Sites               | Chromium (ug/L) ** |                 |                         |                                            | Copper (ug/L) ** |                 |                         |                                            |
|--------------|--------------------------|--------------------|-----------------|-------------------------|--------------------------------------------|------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)      | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)    | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 1.150              | 0.833           | YES                     | 0.317                                      | 3.27             | 0.66            | YES                     | 2.610                                      |
| 2            | Menominee River          | 0.410              | 0.874           | no                      | -0.464                                     | 0.82             | 0.38            | YES                     | 0.440                                      |
| 3            | Escanaba River           | 0.661              | 0.265           | YES                     | 0.396                                      | 0.69             | 0.27            | YES                     | 0.420                                      |
| 4            | Sturgeon River           | 0.451              | 0.357           | YES                     | 0.094                                      | 0.42             | 0.39            | YES                     | 0.030                                      |
| 5            | Manistique River         | 0.420              | 0.239           | YES                     | 0.181                                      | 0.37             | 0.20            | YES                     | 0.170                                      |
| 6            | Tahquamenon River        | 0.424              | 0.276           | YES                     | 0.148                                      | 0.41             | 0.24            | YES                     | 0.170                                      |
| 7            | Pine River               | 1.410              | 0.502           | YES                     | 0.908                                      | 1.26             | 0.86            | YES                     | 0.400                                      |
| 8            | Cheboygan River          | 0.110              | 0.120           | no                      | -0.010                                     | 0.52             | 0.37            | YES                     | 0.150                                      |
| 9            | Boardman River           | 0.231              | 0.263           | no                      | -0.032                                     | 0.32             | 0.35            | no                      | -0.030                                     |
| 10           | Manistee River           | 0.300              | 0.202           | YES                     | 0.098                                      | 0.46             | 0.45            | YES                     | 0.010                                      |
| 11           | Pere Marquette River     | 0.433              | 0.218           | YES                     | 0.215                                      | 0.49             | 0.34            | YES                     | 0.150                                      |
| 12           | Muskegon River (Lower)   | 0.281              | 0.245           | YES                     | 0.036                                      | 0.68             | 0.32            | YES                     | 0.360                                      |
| 13           | Muskegon River (Upper)   | 0.350              | 0.245           | YES                     | 0.105                                      | 0.62             | 0.32            | YES                     | 0.300                                      |
| 14           | Grand River (Lower)      | 1.115              | 0.246           | YES                     | 0.869                                      | 2.34             | 1.20            | YES                     | 1.140                                      |
| 15           | Grand River (Upper)      | 0.764              | 0.080           | YES                     | 0.684                                      | 2.37             | 0.64            | YES                     | 1.730                                      |
| 16           | Kalamazoo River (Lower)  | 0.704              | 0.235           | YES                     | 0.469                                      | 1.42             | 0.47            | YES                     | 0.950                                      |
| 17           | Kalamazoo River (Upper)  | 1.110              | 0.235           | YES                     | 0.875                                      | 1.38             | 0.47            | YES                     | 0.910                                      |
| 18           | St. Joseph River (Lower) | 0.640              | 0.179           | YES                     | 0.461                                      | 1.52             | 1.08            | YES                     | 0.440                                      |
| 19           | St. Joseph River (Upper) | 0.190              | 0.320           | no                      | -0.130                                     | 0.67             | 0.70            | no                      | -0.030                                     |
| 20           | River Raisin             | 0.739              | 0.186           | YES                     | 0.553                                      | 2.39             | 0.50            | YES                     | 1.890                                      |
| 21           | Huron River              | 0.556              | 0.326           | YES                     | 0.230                                      | 1.63             | 0.91            | YES                     | 0.720                                      |
| 22           | River Rouge              | 1.430              | 0.857           | YES                     | 0.573                                      | 2.78             | 1.87            | YES                     | 0.910                                      |
| 23           | Clinton River            | 1.540              | 0.120           | YES                     | 1.420                                      | 3.67             | 1.64            | YES                     | 2.030                                      |
| 24           | Black River              | 0.953              | 0.602           | YES                     | 0.351                                      | 2.10             | 1.63            | YES                     | 0.470                                      |
| 25           | Flint River              | 1.260              | 0.262           | YES                     | 0.998                                      | 2.58             | 0.57            | YES                     | 2.010                                      |
| 26           | Cass River               | 0.932              | 0.223           | YES                     | 0.709                                      | 1.91             | 0.77            | YES                     | 1.140                                      |
| 27           | Shiawassee River         | 0.685              | 0.020           | YES                     | 0.665                                      | 1.70             | 0.46            | YES                     | 1.240                                      |
| 28           | Tittabawassee River      | 0.537              | 0.372           | YES                     | 0.165                                      | 1.78             | 0.43            | YES                     | 1.350                                      |
| 29           | Saginaw River            | 0.974              | --              | --                      | --                                         | 2.15             | --              | --                      | --                                         |
| 30           | Au Sable River           | 0.080              | 2.160           | no                      | -2.080                                     | 0.25             | 0.51            | no                      | -0.260                                     |
| 31           | Thunder Bay River        | 0.090              | 0.120           | no                      | -0.030                                     | 0.39             | 0.28            | YES                     | 0.110                                      |
|              |                          |                    |                 |                         |                                            |                  |                 |                         |                                            |
|              | Summary Stat I:          |                    |                 | 24                      | 80%                                        |                  |                 | 27                      | 90%                                        |
|              | Summary Stat II:         |                    |                 | 0                       | 0%                                         |                  |                 | 0                       | 0%                                         |
|              | Summary Stat III:        |                    |                 |                         |                                            |                  |                 |                         |                                            |

|              | Main Sites               | Mercury (ng/L) ** |                 |                         |                                            | Nickel (ug/L) ** |                 |                         |                                            |
|--------------|--------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)    | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 2.54              | 1.37            | YES                     | 1.170                                      | 1.110            | --              | --                      | --                                         |
| 2            | Menominee River          | 2.47              | 1.66            | YES                     | 0.810                                      | 0.774            | 0.397           | YES                     | 0.377                                      |
| 3            | Escanaba River           | 2.76              | 1.43            | YES                     | 1.330                                      | 0.770            | 0.445           | YES                     | 0.325                                      |
| 4            | Sturgeon River           | 2.68              | 2.27            | YES                     | 0.410                                      | 0.600            | --              | --                      | --                                         |
| 5            | Manistique River         | 2.24              | 1.00            | YES                     | 1.240                                      | 0.517            | 0.317           | YES                     | 0.200                                      |
| 6            | Tahquamenon River        | 3.99              | 0.45            | YES                     | 3.540                                      | 0.494            | 0.421           | YES                     | 0.073                                      |
| 7            | Pine River               | 4.14              | 2.67            | YES                     | 1.470                                      | 1.360            | 1.075           | YES                     | 0.285                                      |
| 8            | Cheboygan River          | 0.45              | 1.00            | no                      | -0.550                                     | 0.661            | 0.826           | no                      | -0.165                                     |
| 9            | Boardman River           | 0.82              | 1.15            | no                      | -0.330                                     | 0.696            | 0.636           | YES                     | 0.060                                      |
| 10           | Manistee River           | 0.95              | 1.96            | no                      | -1.010                                     | 0.750            | 0.756           | no                      | -0.006                                     |
| 11           | Pere Marquette River     | 1.90              | 1.71            | YES                     | 0.190                                      | 0.867            | 0.534           | YES                     | 0.333                                      |
| 12           | Muskegon River (Lower)   | 1.10              | 1.31            | no                      | -0.210                                     | 0.886            | 0.655           | YES                     | 0.231                                      |
| 13           | Muskegon River (Upper)   | 1.71              | 1.31            | YES                     | 0.400                                      | 0.815            | 0.655           | YES                     | 0.160                                      |
| 14           | Grand River (Lower)      | 3.56              | 0.86            | YES                     | 2.700                                      | 2.920            | 2.055           | YES                     | 0.865                                      |
| 15           | Grand River (Upper)      | 2.76              | 1.64            | YES                     | 1.120                                      | 2.990            | 1.345           | YES                     | 1.645                                      |
| 16           | Kalamazoo River (Lower)  | 5.21              | 1.48            | YES                     | 3.730                                      | 2.080            | 1.500           | YES                     | 0.580                                      |
| 17           | Kalamazoo River (Upper)  | 4.23              | 1.48            | YES                     | 2.750                                      | 1.730            | 1.500           | YES                     | 0.230                                      |
| 18           | St. Joseph River (Lower) | 3.04              | 0.92            | YES                     | 2.120                                      | 2.100            | --              | --                      | --                                         |
| 19           | St. Joseph River (Upper) | 1.36              | 1.58            | no                      | -0.220                                     | 1.255            | 1.125           | YES                     | 0.130                                      |
| 20           | River Raisin             | 1.81              | 0.82            | YES                     | 0.990                                      | 2.800            | 1.145           | YES                     | 1.655                                      |
| 21           | Huron River              | 1.61              | 0.95            | YES                     | 0.660                                      | 3.010            | 1.930           | YES                     | 1.080                                      |
| 22           | River Rouge              | 3.30              | 1.64            | YES                     | 1.660                                      | 2.610            | 2.750           | no                      | -0.140                                     |
| 23           | Clinton River            | 3.64              | 1.62            | YES                     | 2.020                                      | 4.430            | 1.430           | YES                     | 3.000                                      |
| 24           | Black River              | 1.64              | 1.20            | YES                     | 0.440                                      | --               | --              | --                      | --                                         |
| 25           | Flint River              | 3.16              | 1.14            | YES                     | 2.020                                      | 4.040            | 1.295           | YES                     | 2.745                                      |
| 26           | Cass River               | 2.05              | 0.93            | YES                     | 1.120                                      | 2.840            | 1.280           | YES                     | 1.560                                      |
| 27           | Shiawassee River         | 1.90              | 0.36            | YES                     | 1.540                                      | 2.250            | 1.000           | YES                     | 1.250                                      |
| 28           | Tittabawassee River      | 1.82              | 0.96            | YES                     | 0.860                                      | 1.770            | 0.919           | YES                     | 0.851                                      |
| 29           | Saginaw River            | 2.18              | --              | --                      | --                                         | 2.930            | --              | --                      | --                                         |
| 30           | Au Sable River           | 0.45              | 0.76            | no                      | -0.310                                     | 0.610            | 0.876           | no                      | -0.266                                     |
| 31           | Thunder Bay River        | 0.62              | 0.61            | YES                     | 0.010                                      | 0.835            | 0.686           | YES                     | 0.149                                      |
|              |                          |                   |                 |                         |                                            |                  |                 |                         |                                            |
|              | Summary Stat I:          |                   |                 | 24                      | 80%                                        |                  |                 | 22                      | 73%                                        |
|              | Summary Stat II:         |                   |                 | 0                       | 0%                                         |                  |                 | 0                       | 0%                                         |
|              | Summary Stat III:        |                   |                 | 6                       | 20%                                        |                  |                 | 4                       | 13%                                        |



|              | Main Sites               | Zinc (ug/L) ** |                 |                         |                                            | Cadmium (ug/L) ** |                 |                         |                                            |
|--------------|--------------------------|----------------|-----------------|-------------------------|--------------------------------------------|-------------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main)  | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)     | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 1.48           | --              | --                      | --                                         | 0.006             | --              | --                      | --                                         |
| 2            | Menominee River          | 1.29           | 0.46            | YES                     | 0.830                                      | 0.006             | 0.024           | no                      | -0.018                                     |
| 3            | Escanaba River           | 4.22           | 0.73            | YES                     | 3.490                                      | 0.044             | 0.006           | YES                     | 0.038                                      |
| 4            | Sturgeon River           | 1.45           | --              | --                      | --                                         | 0.006             | --              | --                      | --                                         |
| 5            | Manistique River         | 0.85           | 0.52            | YES                     | 0.330                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 6            | Tahquamenon River        | 1.05           | 0.28            | YES                     | 0.770                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 7            | Pine River               | 3.05           | 2               | YES                     | 1.050                                      | 0.006             | 0.015           | no                      | -0.009                                     |
| 8            | Cheboygan River          | 0.43           | 0.38            | YES                     | 0.050                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 9            | Boardman River           | 0.5            | 0.53            | no                      | -0.030                                     | 0.006             | 0.006           | --                      | --                                         |
| 10           | Manistee River           | 0.72           | 1.93            | no                      | -1.210                                     | 0.006             | 0.015           | no                      | -0.009                                     |
| 11           | Pere Marquette River     | 1.39           | 0.84            | YES                     | 0.550                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 12           | Muskegon River (Lower)   | 0.8            | 0.81            | no                      | -0.010                                     | 0.006             | 0.006           | same                    | 0.000                                      |
| 13           | Muskegon River (Upper)   | 1.29           | 0.81            | YES                     | 0.480                                      | 0.006             | 0.006           | same                    | 0.000                                      |
| 14           | Grand River (Lower)      | 5.05           | 1.05            | YES                     | 4.000                                      | 0.037             | 0.015           | YES                     | 0.022                                      |
| 15           | Grand River (Upper)      | 3.46           | 1.78            | YES                     | 1.680                                      | 0.024             | 0.006           | YES                     | 0.018                                      |
| 16           | Kalamazoo River (Lower)  | 3.69           | 0.99            | YES                     | 2.700                                      | 0.024             | 0.024           | same                    | 0.000                                      |
| 17           | Kalamazoo River (Upper)  | 5.87           | 0.99            | YES                     | 4.880                                      | 0.024             | 0.024           | same                    | 0.000                                      |
| 18           | St. Joseph River (Lower) | 3.9            | --              | --                      | --                                         | 0.037             | --              | --                      | --                                         |
| 19           | St. Joseph River (Upper) | 1.21           | 1.97            | no                      | -0.760                                     | 0.006             | 0.015           | no                      | -0.009                                     |
| 20           | River Raisin             | 3.89           | 0.8             | YES                     | 3.090                                      | 0.024             | 0.006           | YES                     | 0.018                                      |
| 21           | Huron River              | 4.96           | 1.3             | YES                     | 3.660                                      | 0.024             | 0.006           | YES                     | 0.018                                      |
| 22           | River Rouge              | 12.2           | 7.54            | YES                     | 4.660                                      | 0.06              | 0.024           | YES                     | 0.036                                      |
| 23           | Clinton River            | 12.85          | 1.49            | YES                     | 11.360                                     | 0.056             | 0.006           | YES                     | 0.050                                      |
| 24           | Black River              | --             | --              | --                      | --                                         | --                | --              | --                      | --                                         |
| 25           | Flint River              | 9.84           | 0.68            | YES                     | 9.160                                      | 0.024             | 0.006           | YES                     |                                            |



|              | Main Sites               | pH            |                 |                         |                                            | Hardness (mg/L) |                 |                         |                                            |
|--------------|--------------------------|---------------|-----------------|-------------------------|--------------------------------------------|-----------------|-----------------|-------------------------|--------------------------------------------|
| Water-shed # | River Name               | Median (Main) | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median | Median (Main)   | Median (MinImp) | Is Main Station Higher? | Difference between Main & Min. Imp. Median |
| 1            | Ontonagon River          | 7.8           | 7.9             | no                      | -0.1                                       | 73              | 66              | YES                     | 7.0                                        |
| 2            | Menominee River          | 8.0           | 8.0             | same                    | 0.0                                        | 120             | 73              | YES                     | 47.0                                       |
| 3            | Escanaba River           | 7.9           | 7.8             | YES                     | 0.1                                        | 117             | 128             | no                      | -11.0                                      |
| 4            | Sturgeon River           | 7.5           | 7.8             | no                      | -0.3                                       | 108             | 99              | YES                     | 9.0                                        |
| 5            | Manistique River         | 7.5           | 7.5             | same                    | 0.0                                        | 89              | 56              | YES                     | 33.0                                       |
| 6            | Tahquamenon River        | 7.4           | 8.1             | no                      | -0.7                                       | 72              | 72              | same                    | 0.0                                        |
| 7            | Pine River               | 7.9           | 7.6             | YES                     | 0.3                                        | 98              | 114             | no                      | -16.0                                      |
| 8            | Cheboygan River          | 8.3           | 8.2             | YES                     | 0.1                                        | 157             | 203             | no                      | -46.0                                      |
| 9            | Boardman River           | 8.0           | 8.0             | same                    | 0.0                                        | 165             | 170             | no                      | -5.0                                       |
| 10           | Manistee River           | 8.0           | 7.8             | YES                     | 0.2                                        | 160             | 206             | no                      | -46.0                                      |
| 11           | Pere Marquette River     | 7.9           | 8.2             | no                      | -0.3                                       | 167             | 158             | YES                     | 9.0                                        |
| 12           | Muskegon River (Lower)   | 8.0           | 8.1             | no                      | -0.1                                       | 165             | 160             | YES                     | 5.0                                        |
| 13           | Muskegon River (Upper)   | 7.9           | 8.1             | no                      | -0.2                                       | 161             | 160             | YES                     | 1.0                                        |
| 14           | Grand River (Lower)      | 8.1           | 8.0             | YES                     | 0.1                                        | 260             | 321             | no                      | -61.0                                      |
| 15           | Grand River (Upper)      | 8.0           | 8.0             | same                    | 0.0                                        | 282             | 276             | YES                     | 6.0                                        |
| 16           | Kalamazoo River (Lower)  | 8.0           | 7.8             | YES                     | 0.2                                        | 245             | 297             | no                      | -52.0                                      |
| 17           | Kalamazoo River (Upper)  | 7.9           | 7.8             | YES                     | 0.1                                        | 279             | 297             | no                      | -18.0                                      |
| 18           | St. Joseph River (Lower) | 8.1           | 8.1             | same                    | 0.0                                        | 263             | 244             | YES                     | 19.0                                       |
| 19           | St. Joseph River (Upper) | 7.9           | 8.0             | no                      | -0.1                                       | 250             | 260             | no                      | -10.0                                      |
| 20           | River Raisin             | 8.1           | 7.9             | YES                     | 0.2                                        | 266             | 229             | YES                     | 37.0                                       |
| 21           | Huron River              | 7.9           | 7.9             | same                    | 0.0                                        | 351             | 263             | YES                     | 88.0                                       |
| 22           | River Rouge              | 7.7           | 7.9             | no                      | -0.2                                       | 150             | 348             | no                      | -198.0                                     |
| 23           | Clinton River            | 7.8           | 7.7             | YES                     | 0.1                                        | 251             | 353             | no                      | -102.0                                     |
| 24           | Black River              | 8.2           | 8.2             | same                    | 0.0                                        | 298             | 330             | no                      | -32.0                                      |
| 25           | Flint River              | 8.1           | 8.0             | YES                     | 0.1                                        | 250             | 299             | no                      | -49.0                                      |
| 26           | Cass River               | 8.0           | 8.1             | no                      | -0.1                                       | 284             | 236             | YES                     | 48.0                                       |
| 27           | Shiawassee River         | 8.2           | 8.0             | YES                     | 0.2                                        | 269             | 269             | same                    | 0.0                                        |
| 28           | Tittabawassee River      | 8.0           | 8.1             | no                      | -0.1                                       | 226             | 187             | YES                     | 39.0                                       |
| 29           | Saginaw River            | 7.9           | --              | --                      | --                                         | 234             | --              | --                      | --                                         |
| 30           | Au Sable River           | 8.1           | 8.0             | YES                     | 0.1                                        | 147             | 200             | no                      | -53.0                                      |
| 31           | Thunder Bay River        | 8.1           | 8.1             | same                    | 0.0                                        | 177             | 191             | no                      | -14.0                                      |
|              |                          |               |                 |                         |                                            |                 |                 |                         |                                            |
|              | Summary Stat I:          |               |                 | 12                      | 40%                                        |                 |                 | 13                      | 43%                                        |
|              | Summary Stat II:</       |               |                 |                         |                                            |                 |                 |                         |                                            |

|                     | Main Sites               | Specific Conductance (uS/cm) |                        |                                |                                                       | Total Dissolved Solids (mg/L) |                        |                                |                                                       |
|---------------------|--------------------------|------------------------------|------------------------|--------------------------------|-------------------------------------------------------|-------------------------------|------------------------|--------------------------------|-------------------------------------------------------|
| <u>Water-shed #</u> | <u>River Name</u>        | <u>Median (Main)</u>         | <u>Median (MinImp)</u> | <u>Is Main Station Higher?</u> | <u>Difference between Main &amp; Min. Imp. Median</u> | <u>Median (Main)</u>          | <u>Median (MinImp)</u> | <u>Is Main Station Higher?</u> | <u>Difference between Main &amp; Min. Imp. Median</u> |
| 1                   | Ontonagon River          | 151                          | 129                    | YES                            | 22.0                                                  | 100                           | 90                     | YES                            | 10.0                                                  |
| 2                   | Menominee River          | 265                          | 152                    | YES                            | 113.0                                                 | 180                           | 100                    | YES                            | 80.0                                                  |
| 3                   | Escanaba River           | 399                          | 243                    | YES                            | 156.0                                                 | 255                           | 160                    | YES                            | 95.0                                                  |
| 4                   | Sturgeon River           | 220                          | 195                    | YES                            | 25.0                                                  | 150                           | 130                    | YES                            | 20.0                                                  |
| 5                   | Manistique River         | 182                          | 114                    | YES                            | 68.0                                                  | 120                           | 80                     | YES                            | 40.0                                                  |
| 6                   | Tahquamenon River        | 149                          | 141                    | YES                            | 8.0                                                   | 100                           | 93                     | YES                            | 7.0                                                   |
| 7                   | Pine River               | 200                          | 214                    | no                             | -14.0                                                 | 130                           | 140                    | no                             | -10.0                                                 |
| 8                   | Cheboygan River          | 320                          | 388                    | no                             | -68.0                                                 | 210                           | 250                    | no                             | -40.0                                                 |
| 9                   | Boardman River           | 326                          | 341                    | no                             | -15.0                                                 | 220                           | 225                    | no                             | -5.0                                                  |
| 10                  | Manistee River           | 328                          | 387                    | no                             | -59.0                                                 | 220                           | 265                    | no                             | -45.0                                                 |
| 11                  | Pere Marquette River     | 344                          | 300                    | YES                            | 44.0                                                  | 230                           | 210                    | YES                            | 20.0                                                  |
| 12                  | Muskegon River (Lower)   | 357                          | 317                    | YES                            | 40.0                                                  | 240                           | 220                    | YES                            | 20.0                                                  |
| 13                  | Muskegon River (Upper)   | 331                          | 317                    | YES                            | 14.0                                                  | 230                           | 220                    | YES                            | 10.0                                                  |
| 14                  | Grand River (Lower)      | 618                          | 625                    | no                             | -7.0                                                  | 410                           | 415                    | no                             | -5.0                                                  |
| 15                  | Grand River (Upper)      | 663                          | 537                    | YES                            | 126.0                                                 | 430                           | 350                    | YES                            | 80.0                                                  |
| 16                  | Kalamazoo River (Lower)  | 576                          | 596                    | no                             | -20.0                                                 | 380                           | 390                    | no                             | -10.0                                                 |
| 17                  | Kalamazoo River (Upper)  | 615                          | 596                    | YES                            | 19.0                                                  | 410                           | 390                    | YES                            | 20.0                                                  |
| 18                  | St. Joseph River (Lower) | 568                          | 541                    | YES                            | 27.0                                                  | 380                           | 360                    | YES                            | 20.0                                                  |
| 19                  | St. Joseph River (Upper) | 510                          | 498                    | YES                            | 12.0                                                  | 340                           | 340                    | same                           | 0.0                                                   |
| 20                  | River Raisin             | 618                          | 491                    | YES                            | 127.0                                                 | 390                           | 324                    | YES                            | 66.0                                                  |
| 21                  | Huron River              | 950                          | 828                    | YES                            | 122.0                                                 | 600                           | 545                    | YES                            | 55.0                                                  |
| 22                  | River Rouge              | 530                          | 1037                   | no                             | -507.0                                                | 355                           | 665                    | no                             | -310.0                                                |
| 23                  | Clinton River            | 907                          | 687                    | YES                            | 220.0                                                 | 600                           | 445                    | YES                            | 155.0                                                 |
| 24                  | Black River              | 677                          | 817                    | no                             | -140.0                                                | 450                           | 530                    | no                             | -80.0                                                 |
| 25                  | Flint River              | 699                          | 592                    | YES                            | 107.0                                                 | 465                           | 390                    | YES                            | 75.0                                                  |
| 26                  | Cass River               | 642                          | 482                    | YES                            | 160.0                                                 | 430                           | 320                    | YES                            | 110.0                                                 |
| 27                  | Shiawassee River         | 689                          | 606                    | YES                            | 83.0                                                  | 450                           | 400                    | YES                            | 50.0                                                  |
| 28                  | Tittabawassee River      | 633                          | 349                    | YES                            | 284.0                                                 | 440                           | 240                    | YES                            | 200.0                                                 |
| 29                  | Saginaw River            | 654                          | --                     | --                             | --                                                    | 440                           | --                     | --                             | --                                                    |
| 30                  | Au Sable River           | 295                          | 387                    | no                             | -92.0                                                 | 200                           | 260                    | no                             | -60.0                                                 |
| 31                  | Thunder Bay River        | 352                          | 377                    | no                             | -25.0                                                 | 230                           | 240                    | no                             | -10.                                                  |

|                     | Main Sites               | Dissolved Oxygen (mg/L) |                        |                                |                                                       |
|---------------------|--------------------------|-------------------------|------------------------|--------------------------------|-------------------------------------------------------|
| <u>Water-shed #</u> | <u>River Name</u>        | <u>Median (Main)</u>    | <u>Median (MinImp)</u> | <u>Is Main Station Higher?</u> | <u>Difference between Main &amp; Min. Imp. Median</u> |
| 1                   | Ontonagon River          | 8.9                     | 10.2                   | no                             | -1.3                                                  |
| 2                   | Menominee River          | 8.9                     | 10.1                   | no                             | -1.2                                                  |
| 3                   | Escanaba River           | 8.6                     | 10                     | no                             | -1.4                                                  |
| 4                   | Sturgeon River           | 9.3                     | 10.1                   | no                             | -0.8                                                  |
| 5                   | Manistique River         | 8.9                     | 10.4                   | no                             | -1.5                                                  |
| 6                   | Tahquamenon River        | 9                       | 10.8                   | no                             | -1.8                                                  |
| 7                   | Pine River               | 9.4                     | 9.9                    | no                             | -0.5                                                  |
| 8                   | Cheboygan River          | 9.3                     | 9.7                    | no                             | -0.4                                                  |
| 9                   | Boardman River           | 10.6                    | 10.2                   | YES                            | 0.4                                                   |
| 10                  | Manistee River           | 9.1                     | 10.4                   | no                             | -1.3                                                  |
| 11                  | Pere Marquette River     | 9.4                     | 10.5                   | no                             | -1.1                                                  |
| 12                  | Muskegon River (Lower)   | 9.3                     | 10.2                   | no                             | -0.9                                                  |
| 13                  | Muskegon River (Upper)   | 9.8                     | 10.2                   | no                             | -0.4                                                  |
| 14                  | Grand River (Lower)      | 10                      | 9.8                    | YES                            | 0.2                                                   |
| 15                  | Grand River (Upper)      | 8.8                     | 7.7                    | YES                            | 1.1                                                   |
| 16                  | Kalamazoo River (Lower)  | 8.8                     | 9.7                    | no                             | -0.9                                                  |
| 17                  | Kalamazoo River (Upper)  | 8                       | 9.7                    | no                             | -1.7                                                  |
| 18                  | St. Joseph River (Lower) | 9.4                     | 8.2                    | YES                            | 1.2                                                   |
| 19                  | St. Joseph River (Upper) | 8.4                     | 8.9                    | no                             | -0.5                                                  |
| 20                  | River Raisin             | 9.3                     | 8.8                    | YES                            | 0.5                                                   |
| 21                  | Huron River              | 8                       | 7                      | YES                            | 1.0                                                   |
| 22                  | River Rouge              | 6.4                     | 8.9                    | no                             | -2.5                                                  |
| 23                  | Clinton River            | 7.8                     | 8.5                    | no                             | -0.7                                                  |
| 24                  | Black River              | 8.3                     | 8.8                    | no                             | -0.5                                                  |
| 25                  | Flint River              | 8.7                     | 9.2                    | no                             | -0.5                                                  |
| 26                  | Cass River               | 8.8                     | 9.3                    | no                             | -0.5                                                  |
| 27                  | Shiawassee River         | 8.6                     | 8.2                    | YES                            | 0.4                                                   |
| 28                  | Tittabawassee River      | 9.1                     | 9.5                    | no                             | -0.4                                                  |
| 29                  | Saginaw River            | 8.2                     | --                     | --                             | --                                                    |
| 30                  | Au Sable River           | 8.9                     | 9.7                    | no                             | -0.8                                                  |
| 31                  | Thunder Bay River        | 8.6                     | 8.8                    | no                             | -0.2                                                  |
|                     |                          |                         |                        |                                |                                                       |
|                     | Summary Stat I:          |                         |                        | 7                              | 23%                                                   |
|                     | Summary Stat II:         |                         |                        | 0                              | 0%                                                    |
|                     | Summary Stat III:        |                         |                        | 23                             | 77%                                                   |

**Appendix C-5.** Estimating relative percentages of various anions and cations that comprise total dissolved solids (TDS) values using medians from Appendix C-1.

**Relative % of Major Cations and Anions**  
(*bold = largest fraction for that river*)

| water-shed # | <i>Intensive &amp; Integrator Sites</i> | Chloride (mg/L) | Sulfate (mg/L) | Calcium (mg/L) | Magnesium (mg/L) | Sodium (mg/L) | Potassium (mg/L) |
|--------------|-----------------------------------------|-----------------|----------------|----------------|------------------|---------------|------------------|
| 1            | NL Ontonagon River 660038               | 8%              | 11%            | <b>55%</b>     | 15%              | 8%            | 3%               |
| 2            | NL Menominee River 550038               | 10%             | 22%            | <b>37%</b>     | 17%              | 12%           | 2%               |
| 3            | NL Escanaba River 210102                | 14%             | 27%            | 20%            | 7%               | <b>30%</b>    | 2%               |
| 4            | NL Sturgeon River 210032                | 3%              | 38%            | <b>46%</b>     | 10%              | 2%            | 1%               |
| 5            | NL Manistique River 770073              | 4%              | 32%            | <b>49%</b>     | 11%              | 4%            | 1%               |
| 6            | NL Tahquamenon River 170141             | 5%              | 23%            | <b>52%</b>     | 13%              | 5%            | 2%               |
| 7            | NL Pine River 490006                    | 6%              | 13%            | <b>54%</b>     | 19%              | 5%            | 2%               |
| 8            | NL Cheboygan River 160073               | 11%             | 9%             | <b>54%</b>     | 18%              | 8%            | 1%               |
| 9            | NC Boardman River 280014                | 10%             | 8%             | <b>60%</b>     | 14%              | 7%            | 1%               |
| 10           | NC Manistee River 510088                | 14%             | 11%            | <b>52%</b>     | 14%              | 8%            | 1%               |
| 11           | SM Pere Marquette River 530027          | 14%             | 15%            | <b>46%</b>     | 15%              | 8%            | 1%               |
| 12           | SM Muskegon River (Lower) 610273        | 19%             | 13%            | <b>43%</b>     | 14%              | 10%           | 1%               |
| 13           | NL Muskegon River (Upper) 670008        | 18%             | 8%             | <b>48%</b>     | 14%              | 11%           | 1%               |
| 14           | SM Grand River (Lower) 700123           | 24%             | 20%            | <b>31%</b>     | 10%              | 13%           | 2%               |
| 15           | SM Grand River (Upper) 340025           | 22%             | 20%            | <b>34%</b>     | 11%              | 12%           | 2%               |
| 16           | SM Kalamazoo River (Lower) 030077       | 23%             | 17%            | <b>34%</b>     | 12%              | 13%           | 1%               |
| 17           | SM Kalamazoo River (Upper) 390598       | 21%             | 17%            | <b>40%</b>     | 12%              | 10%           | 1%               |
| 18           | SM St. Joseph River (Lower) 110628      | 17%             | 21%            | <b>39%</b>     | 12%              | 9%            | 1%               |
| 19           | SM St. Joseph River (Upper) 750273      | 15%             | 21%            | <b>43%</b>     | 13%              | 7%            | 1%               |
| 20           | HE River Raisin 580046                  | 21%             | 23%            | <b>35%</b>     | 10%              | 10%           | 2%               |
| 21           | HE Huron River 580364                   | 25%             | <b>31%</b>     | 25%            | 7%               | 13%           | 1%               |
| 22           | HE River Rouge 820070                   | <b>38%</b>      | 12%            | 20%            | 5%               | 20%           | 3%               |
| 23           | HE Clinton River 500233                 | <b>41%</b>      | 9%             | 19%            | 5%               | 24%           | 1%               |
| 24           | HE Black River 740267                   | 21%             | 26%            | <b>30%</b>     | 11%              | 11%           | 2%               |
| 25           | HE Flint River 730285                   | <b>33%</b>      | 13%            | 25%            | 9%               | 18%           | 2%               |
| 26           | HE Cass River 730024                    | 19%             | 24%            | <b>35%</b>     | 11%              | 9%            | 2%               |
| 27           | HE Shiawassee River 730023              | <b>31%</b>      | 13%            | 28%            | 11%              | 16%           | 2%               |
| 28           | HE Tittabawassee River 730025           | <b>35%</b>      | 13%            | 24%            | 7%               | 20%           | 1%               |
| 29           | HE Saginaw River 090177                 | <b>31%</b>      | 14%            | 27%            | 9%               | 17%           | 2%               |
| 30           | NL Au Sable River 350061                | 9%              | 9%             | <b>59%</b>     | 16%              | 7%            | 1%               |
| 31           | NL Thunder Bay River 040123             | 8%              | 7%             | <b>59%</b>     | 18%              | 7%            | 1%               |

Appendix C-6. Percentage of various types of land uses within watersheds upstream of Great Lakes Tributaries 'Main' Sites delineated using the Watershed Tool in ArcGIS. Refer to report text for more details. Bold text indicates the dominant land use type for each watershed.

| Water-shed # | River Name             | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|------------------------|---------------|------------------------------|--------------------|--------------|------|
| <b>1</b>     | <b>Ontonagon River</b> | <b>660038</b> | <b>Deciduous Forest</b>      | <b>343378.0</b>    | <b>38.6</b>  |      |
| 1            | Ontonagon River        | 660038        | Mixed Forest                 | 146134.5           | 16.4         |      |
| 1            | Ontonagon River        | 660038        | Woody Wetlands               | 142932.5           | 16.1         |      |
| 1            | Ontonagon River        | 660038        | Evergreen Forest             | 123988.3           | 14.0         |      |
| 1            | Ontonagon River        | 660038        | Open Water                   | 36878.1            | 4.1          |      |
| 1            | Ontonagon River        | 660038        | Shrub/Scrub                  | 19278.9            | 2.2          |      |
| 1            | Ontonagon River        | 660038        | Developed, Open Space        | 19135.9            | 2.2          |      |
| 1            | Ontonagon River        | 660038        | Pasture/Hay                  | 16800.7            | 1.9          |      |
| 1            | Ontonagon River        | 660038        | Cultivated Crops             | 13927.6            | 1.6          |      |
| 1            | Ontonagon River        | 660038        | Emergent Herbaceous Wetlands | 11888.6            | 1.3          |      |
| 1            | Ontonagon River        | 660038        | Grassland                    | 10312.4            | 1.2          |      |
| 1            | Ontonagon River        | 660038        | Developed, Low Intensity     | 2677.9             | 0.3          |      |
| 1            | Ontonagon River        | 660038        | Barren Land                  | 590.7              | 0.1          |      |
| 1            | Ontonagon River        | 660038        | Developed, Medium Intensity  | 359.0              | 0.0          |      |
| 1            | Ontonagon River        | 660038        | Developed, High Intensity    | 68.7               | 0.0          |      |
| <b>2</b>     | <b>Menominee River</b> | <b>550038</b> | <b>Deciduous Forest</b>      | <b>1015449.4</b>   | <b>39.0</b>  |      |
| 2            | Menominee River        | 550038        | Woody Wetlands               | 762960.5           | 29.3         |      |
| 2            | Menominee River        | 550038        | Mixed Forest                 | 237350.5           | 9.1          |      |
| 2            | Menominee River        | 550038        | Evergreen Forest             | 138800.2           | 5.3          |      |
| 2            | Menominee River        | 550038        | Developed, Open Space        | 77885.1            | 3.0          |      |
| 2            | Menominee River        | 550038        | Open Water                   | 76670.9            | 2.9          |      |
| 2            | Menominee River        | 550038        | Cultivated Crops             | 66863.4            | 2.6          |      |
| 2            | Menominee River        | 550038        | Grassland                    | 61442.4            | 2.4          |      |
| 2            | Menominee River        | 550038        | Shrub/Scrub                  | 50262.3            | 1.9          |      |
| 2            | Menominee River        | 550038        | Pasture/Hay                  | 46056.5            | 1.8          |      |
| 2            | Menominee River        | 550038        | Emergent Herbaceous Wetlands | 43447.4            | 1.7          |      |
| 2            | Menominee River        | 550038        | Developed, Low Intensity     | 15711.6            | 0.6          |      |
| 2            | Menominee River        | 550038        | Developed, Medium Intensity  | 3675.8             | 0.1          |      |
| 2            | Menominee River        | 550038        | Barren Land                  | 3572.5             | 0.1          |      |
| 2            | Menominee River        | 550038        | Developed, High Intensity    | 1495.9             | 0.1          |      |
| <b>3</b>     | <b>Escanaba River</b>  | <b>210102</b> | <b>Woody Wetlands</b>        | <b>113721.9</b>    | <b>49.6</b>  |      |
| 3            | Escanaba River         | 210102        | Deciduous Forest             | 41978.4            | 18.3         |      |
| 3            | Escanaba River         | 210102        | Mixed Forest                 | 15121.3            | 6.6          |      |
| 3            | Escanaba River         | 210102        | Evergreen Forest             | 12507.1            | 5.5          |      |
| 3            | Escanaba River         | 210102        | Pasture/Hay                  | 11712.0            | 5.1          |      |
| 3            | Escanaba River         | 210102        | Grassland/Herbaceous         | 7402.3             | 3.2          |      |
| 3            | Escanaba River         | 210102        | Developed, Open Space        | 6452.3             | 2.8          |      |
| 3            | Escanaba River         | 210102        | Emergent Herbaceous Wetlands | 5353.1             | 2.3          |      |
| 3            | Escanaba River         | 210102        | Shrub/Scrub                  | 5259.9             | 2.3          |      |
| 3            | Escanaba River         | 210102        | OpenWater                    | 3228.5             |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name               | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|--------------------------|---------------|------------------------------|--------------------|--------------|------|
| 3            | Escanaba River           | 210102        | Developed, High Intensity    | 173.2              | 0.1          |      |
| <b>4</b>     | <b>Sturgeon River</b>    | <b>210032</b> | <b>Woody Wetlands</b>        | <b>60439.3</b>     | <b>43.5</b>  |      |
| 4            | Sturgeon River           | 210032        | Deciduous Forest             | 37356.9            | 26.9         |      |
| 4            | Sturgeon River           | 210032        | Evergreen Forest             | 12941.9            | 9.3          |      |
| 4            | Sturgeon River           | 210032        | Mixed Forest                 | 9965.7             | 7.2          |      |
| 4            | Sturgeon River           | 210032        | Emergent Herbaceous Wetlands | 4460.9             | 3.2          |      |
| 4            | Sturgeon River           | 210032        | Open Water                   | 3894.1             | 2.8          |      |
| 4            | Sturgeon River           | 210032        | Shrub/Scrub                  | 3179.0             | 2.3          |      |
| 4            | Sturgeon River           | 210032        | Developed, Open Space        | 2950.3             | 2.1          |      |
| 4            | Sturgeon River           | 210032        | Grassland                    | 2607.7             | 1.9          |      |
| 4            | Sturgeon River           | 210032        | Barren Land                  | 475.4              | 0.3          |      |
| 4            | Sturgeon River           | 210032        | Developed, Low Intensity     | 385.3              | 0.3          |      |
| 4            | Sturgeon River           | 210032        | Pasture/Hay                  | 215.8              | 0.2          |      |
| 4            | Sturgeon River           | 210032        | Cultivated Crops             | 46.0               | 0.0          |      |
| 4            | Sturgeon River           | 210032        | Developed, Medium Intensity  | 23.4               | 0.0          |      |
| <b>5</b>     | <b>Manistique River</b>  | <b>770073</b> | <b>Woody Wetlands</b>        | <b>323627.4</b>    | <b>34.4</b>  |      |
| 5            | Manistique River         | 770073        | Deciduous Forest             | 215875.8           | 23.0         |      |
| 5            | Manistique River         | 770073        | Evergreen Forest             | 114560.0           | 12.2         |      |
| 5            | Manistique River         | 770073        | Emergent Herbaceous Wetlands | 114115.2           | 12.1         |      |
| 5            | Manistique River         | 770073        | Open Water                   | 42313.4            | 4.5          |      |
| 5            | Manistique River         | 770073        | Grassland                    | 38939.1            | 4.1          |      |
| 5            | Manistique River         | 770073        | Shrub/Scrub                  | 33292.8            | 3.5          |      |
| 5            | Manistique River         | 770073        | Developed, Open Space        | 20845.9            | 2.2          |      |
| 5            | Manistique River         | 770073        | Mixed Forest                 | 20453.3            | 2.2          |      |
| 5            | Manistique River         | 770073        | Pasture/Hay                  | 6167.6             | 0.7          |      |
| 5            | Manistique River         | 770073        | Developed, Low Intensity     | 4938.7             | 0.5          |      |
| 5            | Manistique River         | 770073        | Cultivated Crops             | 2899.9             | 0.3          |      |
| 5            | Manistique River         | 770073        | Barren Land                  | 1009.9             | 0.1          |      |
| 5            | Manistique River         | 770073        | Developed, Medium Intensity  | 542.6              | 0.1          |      |
| 5            | Manistique River         | 770073        | Developed, High Intensity    | 30.6               | 0.0          |      |
| <b>6</b>     | <b>Tahquamenon River</b> | <b>170141</b> | <b>Woody Wetlands</b>        | <b>252413.5</b>    | <b>48.7</b>  |      |
| 6            | Tahquamenon River        | 170141        | Deciduous Forest             | 141777.3           | 27.4         |      |
| 6            | Tahquamenon River        | 170141        | Emergent Herbaceous Wetlands | 37929.9            | 7.3          |      |
| 6            | Tahquamenon River        | 170141        | Evergreen Forest             | 35170.3            | 6.8          |      |
| 6            | Tahquamenon River        | 170141        | Grassland                    | 14335.7            | 2.8          |      |
| 6            | Tahquamenon River        | 170141        | Shrub/Scrub                  | 10218.3            | 2.0          |      |
| 6            | Tahquamenon River        | 170141        | Developed, Open Space        | 8733.7             | 1.7          |      |
| 6            | Tahquamenon River        | 170141        | Mixed Forest                 | 5397.9             | 1.0          |      |
| 6            | Tahquamenon River        | 170141        | Open Water                   | 4547.1             | 0.9          |      |
| 6            | Tahquamenon River        | 170141        | Pasture/Hay                  | 2505.1             | 0.5          |      |
| 6            | Tahquamenon River        | 170141        | Developed, Low Intensity     | 2344.8             | 0.5          |      |

## Appendix C-6 cont'd

| Water-shed # | River Name             | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|------------------------|---------------|------------------------------|--------------------|--------------|------|
| 7            | Pine River             | 490006        | Evergreen Forest             | 35589.0            | 20.2         |      |
| 7            | Pine River             | 490006        | Deciduous Forest             | 27337.5            | 15.5         |      |
| 7            | Pine River             | 490006        | Emergent Herbaceous Wetlands | 10731.6            | 6.1          |      |
| 7            | Pine River             | 490006        | Pasture/Hay                  | 9480.2             | 5.4          |      |
| 7            | Pine River             | 490006        | Grassland                    | 7243.0             | 4.1          |      |
| 7            | Pine River             | 490006        | Shrub/Scrub                  | 7231.2             | 4.1          |      |
| 7            | Pine River             | 490006        | Cultivated Crops             | 6867.4             | 3.9          |      |
| 7            | Pine River             | 490006        | Mixed Forest                 | 6331.1             | 3.6          |      |
| 7            | Pine River             | 490006        | Developed, Open Space        | 4836.8             | 2.7          |      |
| 7            | Pine River             | 490006        | Developed, Low Intensity     | 1197.3             | 0.7          |      |
| 7            | Pine River             | 490006        | Open Water                   | 244.6              | 0.1          |      |
| 7            | Pine River             | 490006        | Barren Land                  | 197.4              | 0.1          |      |
| 7            | Pine River             | 490006        | Developed, Medium Intensity  | 126.9              | 0.1          |      |
| 7            | Pine River             | 490006        | Developed, High Intensity    | 22.3               | 0.0          |      |
| <b>8</b>     | <b>Cheboygan River</b> | <b>160073</b> | <b>Deciduous Forest</b>      | <b>343827.1</b>    | <b>36.0</b>  |      |
| 8            | Cheboygan River        | 160073        | Woody Wetlands               | 174039.0           | 18.2         |      |
| 8            | Cheboygan River        | 160073        | Evergreen Forest             | 79463.7            | 8.3          |      |
| 8            | Cheboygan River        | 160073        | Grassland                    | 77334.8            | 8.1          |      |
| 8            | Cheboygan River        | 160073        | Open Water                   | 61322.6            | 6.4          |      |
| 8            | Cheboygan River        | 160073        | Cultivated Crops             | 51096.5            | 5.3          |      |
| 8            | Cheboygan River        | 160073        | Shrub/Scrub                  | 46222.6            | 4.8          |      |
| 8            | Cheboygan River        | 160073        | Developed, Open Space        | 42370.2            | 4.4          |      |
| 8            | Cheboygan River        | 160073        | Mixed Forest                 | 34822.4            | 3.6          |      |
| 8            | Cheboygan River        | 160073        | Developed, Low Intensity     | 14163.4            | 1.5          |      |
| 8            | Cheboygan River        | 160073        | Pasture/Hay                  | 13863.1            | 1.5          |      |
| 8            | Cheboygan River        | 160073        | Emergent Herbaceous Wetlands | 13400.9            | 1.4          |      |
| 8            | Cheboygan River        | 160073        | Developed, Medium Intensity  | 1977.2             | 0.2          |      |
| 8            | Cheboygan River        | 160073        | Barren Land                  | 1174.8             | 0.1          |      |
| 8            | Cheboygan River        | 160073        | Developed, High Intensity    | 438.6              | 0.0          |      |
| <b>9</b>     | <b>Boardman River</b>  | <b>280014</b> | <b>Deciduous Forest</b>      | <b>42813.9</b>     | <b>27.3</b>  |      |
| 9            | Boardman River         | 280014        | Grassland                    | 23783.2            | 15.1         |      |
| 9            | Boardman River         | 280014        | Evergreen Forest             | 21741.7            | 13.8         |      |
| 9            | Boardman River         | 280014        | Woody Wetlands               | 16355.3            | 10.4         |      |
| 9            | Boardman River         | 280014        | Cultivated Crops             | 11052.0            | 7.0          |      |
| 9            | Boardman River         | 280014        | Shrub/Scrub                  | 10619.5            | 6.8          |      |
| 9            | Boardman River         | 280014        | Mixed Forest                 | 10339.2            | 6.6          |      |
| 9            | Boardman River         | 280014        | Developed, Open Space        | 9547.1             | 6.1          |      |
| 9            | Boardman River         | 280014        | Developed, Low Intensity     | 2843.0             | 1.8          |      |
| 9            | Boardman River         | 280014        | Pasture/Hay                  | 2799.6             | 1.8          |      |
| 9            | Boardman River         | 280014        | Open Water                   | 2717.8             | 1.7          |      |
| 9            | Boardman River         | 280014        | Emergent Herbaceous Wetlands | 1460.4             | 0.9          |      |
| 9            | Boardman River         | 28            |                              |                    |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name                    | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|-------------------------------|---------------|------------------------------|--------------------|--------------|------|
| 10           | Manistee River                | 510088        | Woody Wetlands               | 116358.1           | 10.6         |      |
| 10           | Manistee River                | 510088        | Cultivated Crops             | 86007.0            | 7.8          |      |
| 10           | Manistee River                | 510088        | Shrub/Scrub                  | 53445.1            | 4.8          |      |
| 10           | Manistee River                | 510088        | Developed, Open Space        | 48585.2            | 4.4          |      |
| 10           | Manistee River                | 510088        | Mixed Forest                 | 38915.4            | 3.5          |      |
| 10           | Manistee River                | 510088        | Pasture/Hay                  | 21507.9            | 2.0          |      |
| 10           | Manistee River                | 510088        | Emergent Herbaceous Wetlands | 16265.2            | 1.5          |      |
| 10           | Manistee River                | 510088        | Open Water                   | 15095.2            | 1.4          |      |
| 10           | Manistee River                | 510088        | Developed, Low Intensity     | 13273.4            | 1.2          |      |
| 10           | Manistee River                | 510088        | Developed, Medium Intensity  | 1811.6             | 0.2          |      |
| 10           | Manistee River                | 510088        | Barren Land                  | 1796.4             | 0.2          |      |
| 10           | Manistee River                | 510088        | Developed, High Intensity    | 304.4              | 0.0          |      |
| <b>11</b>    | <b>Pere Marquette River</b>   | <b>530027</b> | <b>Deciduous Forest</b>      | <b>181369.0</b>    | <b>41.2</b>  |      |
| 11           | Pere Marquette River          | 530027        | Evergreen Forest             | 53773.1            | 12.2         |      |
| 11           | Pere Marquette River          | 530027        | Woody Wetlands               | 52581.8            | 11.9         |      |
| 11           | Pere Marquette River          | 530027        | Mixed Forest                 | 34411.6            | 7.8          |      |
| 11           | Pere Marquette River          | 530027        | Cultivated Crops             | 31996.5            | 7.3          |      |
| 11           | Pere Marquette River          | 530027        | Grassland                    | 22212.6            | 5.0          |      |
| 11           | Pere Marquette River          | 530027        | Developed, Open Space        | 17554.4            | 4.0          |      |
| 11           | Pere Marquette River          | 530027        | Shrub/Scrub                  | 16358.2            | 3.7          |      |
| 11           | Pere Marquette River          | 530027        | Emergent Herbaceous Wetlands | 10999.1            | 2.5          |      |
| 11           | Pere Marquette River          | 530027        | Pasture/Hay                  | 8873.7             | 2.0          |      |
| 11           | Pere Marquette River          | 530027        | Open Water                   | 5332.1             | 1.2          |      |
| 11           | Pere Marquette River          | 530027        | Developed, Low Intensity     | 3665.6             | 0.8          |      |
| 11           | Pere Marquette River          | 530027        | Developed, Medium Intensity  | 438.1              | 0.1          |      |
| 11           | Pere Marquette River          | 530027        | Barren Land                  | 220.1              | 0.1          |      |
| 11           | Pere Marquette River          | 530027        | Developed, High Intensity    | 162.1              | 0.0          |      |
| <b>12</b>    | <b>Muskegon River (Lower)</b> | <b>610273</b> | <b>Deciduous Forest</b>      | <b>494667.3</b>    | <b>31.2</b>  |      |
| 12           | Muskegon River (Lower)        | 610273        | Woody Wetlands               | 250976.8           | 15.8         |      |
| 12           | Muskegon River (Lower)        | 610273        | Cultivated Crops             | 188906.5           | 11.9         |      |
| 12           | Muskegon River (Lower)        | 610273        | Pasture/Hay                  | 122468.1           | 7.7          |      |
| 12           | Muskegon River (Lower)        | 610273        | Grassland                    | 107065.5           | 6.7          |      |
| 12           | Muskegon River (Lower)        | 610273        | Evergreen Forest             | 102937.9           | 6.5          |      |
| 12           | Muskegon River (Lower)        | 610273        | Developed, Open Space        | 77745.1            | 4.9          |      |
| 12           | Muskegon River (Lower)        | 610273        | Open Water                   | 63411.8            | 4.0          |      |
| 12           | Muskegon River (Lower)        | 610273        | Shrub/Scrub                  | 50566.0            | 3.2          |      |
| 12           | Muskegon River (Lower)        | 610273        | Emergent Herbaceous Wetlands | 43190.7            | 2.7          |      |
| 12           | Muskegon River (Lower)        | 610273        | Mixed Forest                 | 39836.0            | 2.5          |      |
| 12           | Muskegon River (Lower)        | 610273        | Developed, Low Intensity     | 33618.9            | 2.1          |      |
| 12           | Muskegon River (Lower)        |               |                              |                    |              |      |



## Appendix C-6 cont'd

| Water-shed # | River Name                 | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|----------------------------|---------------|------------------------------|--------------------|--------------|------|
| 13           | Muskegon River (Upper)     | 670008        | Pasture/Hay                  | 64987.2            | 6.2          |      |
| 13           | Muskegon River (Upper)     | 670008        | Developed, Open Space        | 52497.0            | 5.0          |      |
| 13           | Muskegon River (Upper)     | 670008        | Open Water                   | 47974.0            | 4.6          |      |
| 13           | Muskegon River (Upper)     | 670008        | Shrub/Scrub                  | 41949.8            | 4.0          |      |
| 13           | Muskegon River (Upper)     | 670008        | Emergent Herbaceous Wetlands | 35131.5            | 3.3          |      |
| 13           | Muskegon River (Upper)     | 670008        | Mixed Forest                 | 30406.8            | 2.9          |      |
| 13           | Muskegon River (Upper)     | 670008        | Developed, Low Intensity     | 19340.5            | 1.8          |      |
| 13           | Muskegon River (Upper)     | 670008        | Developed, Medium Intensity  | 4262.0             | 0.4          |      |
| 13           | Muskegon River (Upper)     | 670008        | Developed, High Intensity    | 1447.4             | 0.1          |      |
| 13           | Muskegon River (Upper)     | 670008        | Barren Land                  | 1362.1             | 0.1          |      |
| <b>14</b>    | <b>Grand River (Lower)</b> | <b>700123</b> | <b>Cultivated Crops</b>      | <b>1257488.6</b>   | <b>37.0</b>  |      |
| 14           | Grand River (Lower)        | 700123        | Pasture/Hay                  | 583824.7           | 17.2         |      |
| 14           | Grand River (Lower)        | 700123        | Deciduous Forest             | 505968.3           | 14.9         |      |
| 14           | Grand River (Lower)        | 700123        | Woody Wetlands               | 398644.1           | 11.7         |      |
| 14           | Grand River (Lower)        | 700123        | Developed, Open Space        | 231285.9           | 6.8          |      |
| 14           | Grand River (Lower)        | 700123        | Developed, Low Intensity     | 174635.9           | 5.1          |      |
| 14           | Grand River (Lower)        | 700123        | Developed, Medium Intensity  | 66328.9            | 2.0          |      |
| 14           | Grand River (Lower)        | 700123        | Open Water                   | 50843.4            | 1.5          |      |
| 14           | Grand River (Lower)        | 700123        | Developed, High Intensity    | 29869.1            | 0.9          |      |
| 14           | Grand River (Lower)        | 700123        | Grassland                    | 27324.0            | 0.8          |      |
| 14           | Grand River (Lower)        | 700123        | Evergreen Forest             | 26832.1            | 0.8          |      |
| 14           | Grand River (Lower)        | 700123        | Mixed Forest                 | 16214.5            | 0.5          |      |
| 14           | Grand River (Lower)        | 700123        | Barren Land                  | 12567.5            | 0.4          |      |
| 14           | Grand River (Lower)        | 700123        | Emergent Herbaceous Wetlands | 11466.6            | 0.3          |      |
| 14           | Grand River (Lower)        | 700123        | Shrub/Scrub                  | 7564.9             | 0.2          |      |
| <b>15</b>    | <b>Grand River (Upper)</b> | <b>340025</b> | <b>Cultivated Crops</b>      | <b>741330.7</b>    | <b>40.1</b>  |      |
| 15           | Grand River (Upper)        | 340025        | Pasture/Hay                  | 354109.4           | 19.2         |      |
| 15           | Grand River (Upper)        | 340025        | Woody Wetlands               | 240236.1           | 13.0         |      |
| 15           | Grand River (Upper)        | 340025        | Deciduous Forest             | 217880.2           | 11.8         |      |
| 15           | Grand River (Upper)        | 340025        | Developed, Open Space        | 115101.2           | 6.2          |      |
| 15           | Grand River (Upper)        | 340025        | Developed, Low Intensity     | 80818.9            | 4.4          |      |
| 15           | Grand River (Upper)        | 340025        | Developed, Medium Intensity  | 28178.1            | 1.5          |      |
| 15           | Grand River (Upper)        | 340025        | Open Water                   | 21474.3            | 1.2          |      |
| 15           |                            |               |                              |                    |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name                      | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|---------------------------------|---------------|------------------------------|--------------------|--------------|------|
| 16           | Kalamazoo River (Lower)         | 30077         | Developed, Medium Intensity  | 18129.0            | 1.4          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Grassland                    | 15355.6            | 1.2          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Evergreen Forest             | 8894.9             | 0.7          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Developed, High Intensity    | 8154.9             | 0.6          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Mixed Forest                 | 7531.8             | 0.6          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Barren Land                  | 5185.6             | 0.4          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Emergent Herbaceous Wetlands | 4622.3             | 0.4          |      |
| 16           | Kalamazoo River (Lower)         | 30077         | Shrub/Scrub                  | 3710.7             | 0.3          |      |
| <b>17</b>    | <b>Kalamazoo River (Upper)</b>  | <b>390598</b> | <b>Cultivated Crops</b>      | <b>219584.3</b>    | <b>35.5</b>  |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Deciduous Forest             | 108667.8           | 17.6         |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Pasture/Hay                  | 99951.5            | 16.2         |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Woody Wetlands               | 89341.6            | 14.4         |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Developed, Open Space        | 43071.5            | 7.0          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Developed, Low Intensity     | 23351.4            | 3.8          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Open Water                   | 7869.3             | 1.3          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Developed, Medium Intensity  | 6794.0             | 1.1          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Grassland                    | 5236.4             | 0.8          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Evergreen Forest             | 3530.1             | 0.6          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Developed, High Intensity    | 2983.8             | 0.5          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Emergent Herbaceous Wetlands | 2595.2             | 0.4          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Mixed Forest                 | 2563.4             | 0.4          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Barren Land                  | 1740.1             | 0.3          |      |
| 17           | Kalamazoo River (Upper)         | 390598        | Shrub/Scrub                  | 1213.7             | 0.2          |      |
| <b>18</b>    | <b>St. Joseph River (Lower)</b> | <b>110628</b> | <b>Cultivated Crops</b>      | <b>1303082.1</b>   | <b>47.7</b>  |      |
| 18           | St. Joseph River (Lower)        | 110628        | Pasture/Hay                  | 338604.6           | 12.4         |      |
| 18           | St. Joseph River (Lower)        | 110628        | Woody Wetlands               | 320408.9           | 11.7         |      |
| 18           | St. Joseph River (Lower)        | 110628        | Deciduous Forest             | 270078.3           | 9.9          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Developed, Open Space        | 179845.4           | 6.6          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Developed, Low Intensity     | 134234.5           | 4.9          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Open Water                   | 66885.7            | 2.4          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Developed, Medium Intensity  | 39446.1            | 1.4          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Grassland                    | 21014.2            | 0.8          |      |
| 18           | St. Joseph River (Lower)        | 110628        | Developed, High Intensity    | 19641.2            |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name               | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|--------------------------|---------------|------------------------------|--------------------|--------------|------|
| 19           | St. Joseph River (Upper) | 750273        | Emergent Herbaceous Wetlands | 6506.3             | 0.5          |      |
| 19           | St. Joseph River (Upper) | 750273        | Developed, High Intensity    | 3138.9             | 0.3          |      |
| 19           | St. Joseph River (Upper) | 750273        | Barren Land                  | 2580.7             | 0.2          |      |
| 19           | St. Joseph River (Upper) | 750273        | Evergreen Forest             | 2565.7             | 0.2          |      |
| 19           | St. Joseph River (Upper) | 750273        | Mixed Forest                 | 2043.1             | 0.2          |      |
| 19           | St. Joseph River (Upper) | 750273        | Shrub/Scrub                  | 1621.2             | 0.1          |      |
| <b>20</b>    | <b>River Raisin</b>      | <b>580046</b> | <b>Cultivated Crops</b>      | <b>334691.2</b>    | <b>49.5</b>  |      |
| 20           | River Raisin             | 580046        | Pasture/Hay                  | 120376.0           | 17.8         |      |
| 20           | River Raisin             | 580046        | Deciduous Forest             | 69874.6            | 10.3         |      |
| 20           | River Raisin             | 580046        | Woody Wetlands               | 50175.7            | 7.4          |      |
| 20           | River Raisin             | 580046        | Developed, Open Space        | 42245.1            | 6.3          |      |
| 20           | River Raisin             | 580046        | Developed, Low Intensity     | 24624.3            | 3.6          |      |
| 20           | River Raisin             | 580046        | Open Water                   | 10022.3            | 1.5          |      |
| 20           | River Raisin             | 580046        | Developed, Medium Intensity  | 6974.1             | 1.0          |      |
| 20           | River Raisin             | 580046        | Grassland                    | 4426.9             | 0.7          |      |
| 20           | River Raisin             | 580046        | Emergent Herbaceous Wetlands | 3878.3             | 0.6          |      |
| 20           | River Raisin             | 580046        | Developed, High Intensity    | 2799.2             | 0.4          |      |
| 20           | River Raisin             | 580046        | Barren Land                  | 1986.1             | 0.3          |      |
| 20           | River Raisin             | 580046        | Shrub/Scrub                  | 1346.1             | 0.2          |      |
| 20           | River Raisin             | 580046        | Evergreen Forest             | 1011.3             | 0.1          |      |
| 20           | River Raisin             | 580046        | Mixed Forest                 | 982.5              | 0.1          |      |
| <b>21</b>    | <b>Huron River</b>       | <b>580364</b> | <b>Deciduous Forest</b>      | <b>117325.4</b>    | <b>20.6</b>  |      |
| 21           | Huron River              | 580364        | Developed, Open Space        | 92782.7            | 16.3         |      |
| 21           | Huron River              | 580364        | Woody Wetlands               | 75005.9            | 13.2         |      |
| 21           | Huron River              | 580364        | Pasture/Hay                  | 73989.5            | 13.0         |      |
| 21           | Huron River              | 580364        | Cultivated Crops             | 66577.3            | 11.7         |      |
| 21           | Huron River              | 580364        | Developed, Low Intensity     | 56564.5            | 10.0         |      |
| 21           | Huron River              | 580364        | Open Water                   | 24090.7            | 4.2          |      |
| 21           | Huron River              | 580364        | Developed, Medium Intensity  | 23523.5            | 4.1          |      |
| 21           | Huron River              | 580364        | Emergent Herbaceous Wetlands | 10755.4            | 1.9          |      |
| 21           | Huron River              | 580364        | Developed, High Intensity    | 9271.9             | 1.6          |      |
| 21           | Huron River              | 580364        | Grassland                    | 6212.9             | 1.1          |      |
| 21           | Huron River              | 580364        | Mixed Forest                 | 3800.7             | 0.7          |      |
| 21           | Huron River              | 580364        | Barren Land                  | 3768.9             | 0.7          |      |
| 21           | Huron River              |               |                              |                    |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name           | STORET ID     | Land Cover                      | Land Cover Acreage | Land Cover % | RANK |
|--------------|----------------------|---------------|---------------------------------|--------------------|--------------|------|
| 22           | River Rouge          | 820070        | Emergent Herbaceous Wetlands    | 781.4              | 0.3          |      |
| 22           | River Rouge          | 820070        | Mixed Forest                    | 507.2              | 0.2          |      |
| 22           | River Rouge          | 820070        | Shrub/Scrub                     | 182.9              | 0.1          |      |
| 22           | River Rouge          | 820070        | Evergreen Forest                | 180.8              | 0.1          |      |
| <b>23</b>    | <b>Clinton River</b> | <b>500233</b> | <b>Developed, Low Intensity</b> | <b>87651.8</b>     | <b>17.3</b>  |      |
| 23           | Clinton River        | 500233        | Developed, Open Space           | 79850.1            | 15.8         |      |
| 23           | Clinton River        | 500233        | Developed, Medium Intensity     | 78990.4            | 15.6         |      |
| 23           | Clinton River        | 500233        | Deciduous Forest                | 65485.4            | 12.9         |      |
| 23           | Clinton River        | 500233        | Cultivated Crops                | 57438.9            | 11.3         |      |
| 23           | Clinton River        | 500233        | Pasture/Hay                     | 36376.2            | 7.2          |      |
| 23           | Clinton River        | 500233        | Woody Wetlands                  | 36226.6            | 7.1          |      |
| 23           | Clinton River        | 500233        | Developed, High Intensity       | 34369.0            | 6.8          |      |
| 23           | Clinton River        | 500233        | Open Water                      | 13593.8            | 2.7          |      |
| 23           | Clinton River        | 500233        | Grassland                       | 5413.1             | 1.1          |      |
| 23           | Clinton River        | 500233        | Emergent Herbaceous Wetlands    | 3575.7             | 0.7          |      |
| 23           | Clinton River        | 500233        | Barren Land                     | 3145.6             | 0.6          |      |
| 23           | Clinton River        | 500233        | Mixed Forest                    | 2079.0             | 0.4          |      |
| 23           | Clinton River        | 500233        | Evergreen Forest                | 1928.9             | 0.4          |      |
| 23           | Clinton River        | 500233        | Shrub/Scrub                     | 761.0              | 0.2          |      |
| <b>24</b>    | <b>Black River</b>   | <b>740267</b> | <b>Cultivated Crops</b>         | <b>243815.7</b>    | <b>55.2</b>  |      |
| 24           | Black River          | 740267        | Pasture/Hay                     | 66685.5            | 15.1         |      |
| 24           | Black River          | 740267        | Deciduous Forest                | 52319.3            | 11.9         |      |
| 24           | Black River          | 740267        | Woody Wetlands                  | 31888.8            | 7.2          |      |
| 24           | Black River          | 740267        | Developed, Open Space           | 18365.0            | 4.2          |      |
| 24           | Black River          | 740267        | Developed, Low Intensity        | 9784.8             | 2.2          |      |
| 24           | Black River          | 740267        | Grassland                       | 4700.7             | 1.1          |      |
| 24           | Black River          | 740267        | Emergent Herbaceous Wetlands    | 3222.3             | 0.7          |      |
| 24           | Black River          | 740267        | Evergreen Forest                | 3017.1             | 0.7          |      |
| 24           | Black River          | 740267        | Mixed Forest                    | 2482.9             | 0.6          |      |
| 24           | Black River          | 740267        | Open Water                      | 1251.0             | 0.3          |      |
| 24           | Black River          | 740267        | Developed, Medium Intensity     | 1154.3             | 0.3          |      |
| 24           | Black River          | 740267        | Barren Land                     | 1139.5             | 0.3          |      |
| 24           | Black River          | 740267        | Shrub/Scrub                     | 1040.4             | 0.2          |      |
| 24           | Black River          | 740267        | Developed, High Intensity       | 417.1              | 0.1          |      |
| <b>25</b>    | <b>Flint River</b>   | <b>730285</b> | <b>Cultivated Crops</b>         | <                  |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name                 | STORET ID     | Land Cover                   | Land Cover Acreage | Land Cover % | RANK |
|--------------|----------------------------|---------------|------------------------------|--------------------|--------------|------|
| 25           | Flint River                | 730285        | Barren Land                  | 4608.7             | 0.6          |      |
| 25           | Flint River                | 730285        | Shrub/Scrub                  | 1862.7             | 0.3          |      |
| <b>26</b>    | <b>Cass River</b>          | <b>730024</b> | <b>Cultivated Crops</b>      | <b>236195.2</b>    | <b>40.9</b>  |      |
| 26           | Cass River                 | 730024        | Deciduous Forest             | 107256.0           | 18.6         |      |
| 26           | Cass River                 | 730024        | Pasture/Hay                  | 92780.0            | 16.1         |      |
| 26           | Cass River                 | 730024        | Woody Wetlands               | 68310.5            | 11.8         |      |
| 26           | Cass River                 | 730024        | Developed, Open Space        | 27004.3            | 4.7          |      |
| 26           | Cass River                 | 730024        | Developed, Low Intensity     | 13331.3            | 2.3          |      |
| 26           | Cass River                 | 730024        | Grassland                    | 10993.9            | 1.9          |      |
| 26           | Cass River                 | 730024        | Emergent Herbaceous Wetlands | 5450.4             | 0.9          |      |
| 26           | Cass River                 | 730024        | Evergreen Forest             | 4896.7             | 0.8          |      |
| 26           | Cass River                 | 730024        | Mixed Forest                 | 3995.7             | 0.7          |      |
| 26           | Cass River                 | 730024        | Developed, Medium Intensity  | 2166.7             | 0.4          |      |
| 26           | Cass River                 | 730024        | Open Water                   | 1566.9             | 0.3          |      |
| 26           | Cass River                 | 730024        | Shrub/Scrub                  | 1455.6             | 0.3          |      |
| 26           | Cass River                 | 730024        | Barren Land                  | 986.8              | 0.2          |      |
| 26           | Cass River                 | 730024        | Developed, High Intensity    | 911.7              | 0.2          |      |
| <b>27</b>    | <b>Shiawassee River</b>    | <b>730023</b> | <b>Cultivated Crops</b>      | <b>122275.4</b>    | <b>29.6</b>  |      |
| 27           | Shiawassee River           | 730023        | Pasture/Hay                  | 82211.3            | 19.9         |      |
| 27           | Shiawassee River           | 730023        | Deciduous Forest             | 70010.9            | 16.9         |      |
| 27           | Shiawassee River           | 730023        | Woody Wetlands               | 48437.6            | 11.7         |      |
| 27           | Shiawassee River           | 730023        | Developed, Open Space        | 37537.8            | 9.1          |      |
| 27           | Shiawassee River           | 730023        | Developed, Low Intensity     | 20917.8            | 5.1          |      |
| 27           | Shiawassee River           | 730023        | Open Water                   | 10527.2            | 2.5          |      |
| 27           | Shiawassee River           | 730023        | Developed, Medium Intensity  | 6779.1             | 1.6          |      |
| 27           | Shiawassee River           | 730023        | Emergent Herbaceous Wetlands | 2876.6             | 0.7          |      |
| 27           | Shiawassee River           | 730023        | Grassland                    | 2758.7             | 0.7          |      |
| 27           | Shiawassee River           | 730023        | Evergreen Forest             | 2563.6             | 0.6          |      |
| 27           | Shiawassee River           | 730023        | Developed, High Intensity    | 2236.6             | 0.5          |      |
| 27           | Shiawassee River           | 730023        | Mixed Forest                 | 2053.6             | 0.5          |      |
| 27           | Shiawassee River           | 730023        | Barren Land                  | 1296.8             | 0.3          |      |
| 27           | Shiawassee River           | 730023        | Shrub/Scrub                  | 553.7              | 0.1          |      |
| <b>28</b>    | <b>Tittabawassee River</b> | <b>730025</b> | <b>Deciduous Forest</b>      | <b>414965.5</b>    | <b>26.2</b>  |      |
| 28           | Tittabawassee River        | 730025        | Cultivated Crops             | 356                |              |      |

## Appendix C-6 cont'd

| Water-shed # | River Name               | STORET ID     | Land Cover                      | Land Cover Acreage | Land Cover % | RANK |
|--------------|--------------------------|---------------|---------------------------------|--------------------|--------------|------|
| <b>29</b>    | <b>Saginaw River</b>     | <b>90177</b>  | <b>Developed, Low Intensity</b> | <b>293.8</b>       | <b>36.9</b>  |      |
| 29           | Saginaw River            | 90177         | Developed, Medium Intensity     | 187.6              | 23.5         |      |
| 29           | Saginaw River            | 90177         | Developed, Open Space           | 182.3              | 22.9         |      |
| 29           | Saginaw River            | 90177         | Open Water                      | 62.5               | 7.8          |      |
| 29           | Saginaw River            | 90177         | Developed, High Intensity       | 58.7               | 7.4          |      |
| 29           | Saginaw River            | 90177         | Woody Wetlands                  | 2.9                | 0.4          |      |
| 29           | Saginaw River            | 90177         | Emergent Herbaceous Wetlands    | 1.1                | 0.1          |      |
| 29           | Saginaw River            | 90177         | Barren Land                     | 1.1                | 0.1          |      |
| 29           | Saginaw River            | 90177         | Cultivated Crops                | 0.7                | 0.1          |      |
| <b>30</b>    | <b>Au Sable River</b>    | <b>350061</b> | <b>Deciduous Forest</b>         | <b>291602.9</b>    | <b>26.7</b>  |      |
| 30           | Au Sable River           | 350061        | Evergreen Forest                | 266092.0           | 24.4         |      |
| 30           | Au Sable River           | 350061        | Shrub/Scrub                     | 115154.6           | 10.6         |      |
| 30           | Au Sable River           | 350061        | Woody Wetlands                  | 112578.6           | 10.3         |      |
| 30           | Au Sable River           | 350061        | Grassland                       | 87122.2            | 8.0          |      |
| 30           | Au Sable River           | 350061        | Developed, Open Space           | 67411.9            | 6.2          |      |
| 30           | Au Sable River           | 350061        | Mixed Forest                    | 64165.3            | 5.9          |      |
| 30           | Au Sable River           | 350061        | Open Water                      | 22792.2            | 2.1          |      |
| 30           | Au Sable River           | 350061        | Developed, Low Intensity        | 20915.9            | 1.9          |      |
| 30           | Au Sable River           | 350061        | Cultivated Crops                | 15469.8            | 1.4          |      |
| 30           | Au Sable River           | 350061        | Emergent Herbaceous Wetlands    | 14866.8            | 1.4          |      |
| 30           | Au Sable River           | 350061        | Pasture/Hay                     | 7301.4             | 0.7          |      |
| 30           | Au Sable River           | 350061        | Developed, Medium Intensity     | 3511.2             | 0.3          |      |
| 30           | Au Sable River           | 350061        | Barren Land                     | 1069.9             | 0.1          |      |
| 30           | Au Sable River           | 350061        | Developed, High Intensity       | 1040.6             | 0.1          |      |
| <b>31</b>    | <b>Thunder Bay River</b> | <b>40123</b>  | <b>Deciduous Forest</b>         | <b>255981.2</b>    | <b>32.0</b>  |      |
| 31           | Thunder Bay River        | 40123         | Woody Wetlands                  | 217219.4           | 27.2         |      |
| 31           | Thunder Bay River        | 40123         | Evergreen Forest                | 56004.8            | 7.0          |      |
| 31           | Thunder Bay River        | 40123         | Grassland                       | 45691.4            | 5.7          |      |
| 31           | Thunder Bay River        | 40123         | Pasture/Hay                     | 43791.4            | 5.5          |      |
| 31           | Thunder Bay River        | 40123         | Cultivated Crops                | 40224.0            | 5.0          |      |
| 31           | Thunder Bay River        | 40123         | Developed, Open Space           | 33503.9            | 4.2          |      |
| 31           | Thunder Bay River        | 40123         | Mixed Forest                    | 29311.9            | 3.7          |      |
| 31           | Thunder Bay River        | 40123         | Open Water                      | 25046.7            | 3.1          |      |
| 31           | Thunder Bay River        | 40123         | Shrub/Scrub                     | 23612.8            | 3.0          |      |
| 31           | Thunder Bay River        | 40123         |                                 |                    |              |      |

| Water-shed # | River Name | STORET ID | Land Cover | Land Cover Acreage | Land Cover % | RANK |
|--------------|------------|-----------|------------|--------------------|--------------|------|
|--------------|------------|-----------|------------|--------------------|--------------|------|

### **RANKING OF DEVELOPED LAND COVER PERCENTAGE**

#### **Developed, High Intensity**

|    |                          |        |                           |         |      |    |
|----|--------------------------|--------|---------------------------|---------|------|----|
| 22 | River Rouge              | 820070 | Developed, High Intensity | 29838.2 | 10.3 | 1  |
| 29 | Saginaw River            | 90177  | Developed, High Intensity | 58.7    | 7.4  | 2  |
| 23 | Clinton River            | 500233 | Developed, High Intensity | 34369.0 | 6.8  | 3  |
| 21 | Huron River              | 580364 | Developed, High Intensity | 9271.9  | 1.6  | 4  |
| 25 | Flint River              | 730285 | Developed, High Intensity | 9349.2  | 1.3  | 5  |
| 14 | Grand River (Lower)      | 700123 | Developed, High Intensity | 29869.1 | 0.9  | 6  |
| 18 | St. Joseph River (Lower) | 110628 | Developed, High Intensity | 19641.2 | 0.7  | 7  |
| 16 | Kalamazoo River (Lower)  | 30077  | Developed, High Intensity | 8154.9  | 0.6  | 8  |
| 15 | Grand River (Upper)      | 340025 | Developed, High Intensity | 11599.3 | 0.6  | 9  |
| 27 | Shiawassee River         | 730023 | Developed, High Intensity | 2236.6  | 0.5  | 10 |
| 17 | Kalamazoo River (Upper)  | 390598 | Developed, High Intensity | 2983.8  | 0.5  | 11 |
| 20 | River Raisin             | 580046 | Developed, High Intensity | 2799.2  | 0.4  | 12 |
| 28 | Tittabawassee River      | 730025 | Developed, High Intensity | 4894.2  | 0.3  | 13 |
| 19 | St. Joseph River (Upper) | 750273 | Developed, High Intensity | 3138.9  | 0.3  | 14 |
| 26 | Cass River               | 730024 | Developed, High Intensity | 911.7   | 0.2  | 15 |
| 13 | Muskegon River (Upper)   | 670008 | Developed, High Intensity | 1447.4  | 0.1  | 16 |
| 12 | Muskegon River (Lower)   | 610273 | Developed, High Intensity | 2166.2  | 0.1  | 17 |
| 9  | Boardman River           | 280014 | Developed, High Intensity | 151.8   | 0.1  | 18 |
| 30 | Au Sable River           | 350061 | Developed, High Intensity | 1040.6  | 0.1  | 19 |
| 24 | Black River              | 740267 | Developed, High Intensity | 417.1   | 0.1  | 20 |
| 3  | Escanaba River           | 210102 | Developed, High Intensity | 173.2   | 0.1  | 21 |
| 2  | Menominee River          | 550038 | Developed, High Intensity | 1495.9  | 0.1  | 22 |
| 31 | Thunder Bay River        | 40123  | Developed, High Intensity | 412.4   | 0.1  | 23 |
| 8  | Cheboygan River          | 160073 | Developed, High Intensity | 438.6   | 0.0  | 24 |
| 11 | Pere Marquette River     | 530027 | Developed, High Intensity | 162.1   | 0.0  | 25 |
| 10 | Manistee River           | 510088 | Developed, High Intensity | 304.4   | 0.0  | 26 |
| 6  | Tahquamenon River        | 170141 | Developed, High Intensity | 124.0   | 0.0  | 27 |
| 7  | Pine River               | 490006 | Developed, High Intensity | 22.3    | 0.0  | 28 |
| 1  | Ontonagon River          | 660038 | Developed, High Intensity | 68.7    | 0.0  | 29 |
| 5  | Manistique River         | 770073 | Developed, High Intensity | 30.6    | 0.0  | 30 |

## Appendix C-6 cont'd

| Water-shed #                           | River Name               | STORET ID     | Land Cover                      | Land Cover Acreage | Land Cover % | RANK     |
|----------------------------------------|--------------------------|---------------|---------------------------------|--------------------|--------------|----------|
| 28                                     | Tittabawassee River      | 730025        | Developed, Medium Intensity     | 11938.7            | 0.8          | 13       |
| 19                                     | St. Joseph River (Upper) | 750273        | Developed, Medium Intensity     | 7355.1             | 0.6          | 14       |
| 12                                     | Muskegon River (Lower)   | 610273        | Developed, Medium Intensity     | 6543.7             | 0.4          | 15       |
| 13                                     | Muskegon River (Upper)   | 670008        | Developed, Medium Intensity     | 4262.0             | 0.4          | 16       |
| 26                                     | Cass River               | 730024        | Developed, Medium Intensity     | 2166.7             | 0.4          | 17       |
| 9                                      | Boardman River           | 280014        | Developed, Medium Intensity     | 538.8              | 0.3          | 18       |
| 30                                     | Au Sable River           | 350061        | Developed, Medium Intensity     | 3511.2             | 0.3          | 19       |
| 24                                     | Black River              | 740267        | Developed, Medium Intensity     | 1154.3             | 0.3          | 20       |
| 3                                      | Escanaba River           | 210102        | Developed, Medium Intensity     | 536.3              | 0.2          | 21       |
| 8                                      | Cheboygan River          | 160073        | Developed, Medium Intensity     | 1977.2             | 0.2          | 22       |
| 31                                     | Thunder Bay River        | 40123         | Developed, Medium Intensity     | 1586.1             | 0.2          | 23       |
| 10                                     | Manistee River           | 510088        | Developed, Medium Intensity     | 1811.6             | 0.2          | 24       |
| 2                                      | Menominee River          | 550038        | Developed, Medium Intensity     | 3675.8             | 0.1          | 25       |
| 6                                      | Tahquamenon River        | 170141        | Developed, Medium Intensity     | 604.3              | 0.1          | 26       |
| 11                                     | Pere Marquette River     | 530027        | Developed, Medium Intensity     | 438.1              | 0.1          | 27       |
| 7                                      | Pine River               | 490006        | Developed, Medium Intensity     | 126.9              | 0.1          | 28       |
| 5                                      | Manistique River         | 770073        | Developed, Medium Intensity     | 542.6              | 0.1          | 29       |
| 1                                      | Ontonagon River          | 660038        | Developed, Medium Intensity     | 359.0              | 0.0          | 30       |
| 4                                      | Sturgeon River           | 210032        | Developed, Medium Intensity     | 23.4               | 0.0          | 31       |
| <b><u>Developed, Low Intensity</u></b> |                          |               |                                 |                    |              |          |
| <b>29</b>                              | <b>Saginaw River</b>     | <b>90177</b>  | <b>Developed, Low Intensity</b> | <b>293.8</b>       | <b>36.9</b>  | <b>1</b> |
| <b>22</b>                              | <b>River Rouge</b>       | <b>820070</b> | <b>Developed, Low Intensity</b> | <b>80247.9</b>     | <b>27.6</b>  | <b>2</b> |
| <b>23</b>                              | <b>Clinton River</b>     | <b>500233</b> | <b>Developed, Low Intensity</b> | <b>87651.8</b>     | <b>17.3</b>  | <b>3</b> |
| 21                                     | Huron River              | 580364        | Developed, Low Intensity        | 56564.5            | 10.0         | 4        |
| 25                                     | Flint River              | 730285        | Developed, Low Intensity        | 52605.3            | 7.1          | 5        |
| 14                                     | Grand River (Lower)      | 700123        | Developed, Low Intensity        | 174635.9           | 5.1          | 6        |
| 27                                     | Shiawassee River         | 730023        | Developed, Low Intensity        | 20917.8            | 5.1          | 7        |
| 18                                     | St. Joseph River (Lower) | 110628        | Developed, Low Intensity        | 134234.5           | 4.9          | 8        |
| 16                                     | Kalamazoo River (Lower)  | 30077         | Developed, Low Intensity        | 59176.3            | 4.7          | 9        |
| 15                                     | Grand River (Upper)      | 340025        | Developed, Low Intensity        | 80818.9            | 4.4          | 10       |
| 17                                     | Kalamazoo River (Upper)  | 390598        | Developed, Low Intensity        | 23351.4            | 3.8          | 11       |
|                                        |                          |               |                                 |                    |              |          |



## Appendix C-6 cont'd

| Water-shed #                        | River Name               | STORET ID | Land Cover               | Land Cover Acreage | Land Cover % | RANK |
|-------------------------------------|--------------------------|-----------|--------------------------|--------------------|--------------|------|
| 1                                   | Ontonagon River          | 660038    | Developed, Low Intensity | 2677.9             | 0.3          | 30   |
| 4                                   | Sturgeon River           | 210032    | Developed, Low Intensity | 385.3              | 0.3          | 31   |
| <b><u>Developed, Open Space</u></b> |                          |           |                          |                    |              |      |
| 29                                  | Saginaw River            | 90177     | Developed, Open Space    | 182.3              | 22.9         | 1    |
| 22                                  | River Rouge              | 820070    | Developed, Open Space    | 61702.7            | 21.2         | 2    |
| 21                                  | Huron River              | 580364    | Developed, Open Space    | 92782.7            | 16.3         | 3    |
| 23                                  | Clinton River            | 500233    | Developed, Open Space    | 79850.1            | 15.8         | 4    |
| 25                                  | Flint River              | 730285    | Developed, Open Space    | 78743.7            | 10.6         | 5    |
| 27                                  | Shiawassee River         | 730023    | Developed, Open Space    | 37537.8            | 9.1          | 6    |
| 17                                  | Kalamazoo River (Upper)  | 390598    | Developed, Open Space    | 43071.5            | 7.0          | 7    |
| 16                                  | Kalamazoo River (Lower)  | 30077     | Developed, Open Space    | 86941.7            | 6.9          | 8    |
| 14                                  | Grand River (Lower)      | 700123    | Developed, Open Space    | 231285.9           | 6.8          | 9    |
| 18                                  | St. Joseph River (Lower) | 110628    | Developed, Open Space    | 179845.4           | 6.6          | 10   |
| 20                                  | River Raisin             | 580046    | Developed, Open Space    | 42245.1            | 6.3          | 11   |
| 15                                  | Grand River (Upper)      | 340025    | Developed, Open Space    | 115101.2           | 6.2          | 12   |
| 30                                  | Au Sable River           | 350061    | Developed, Open Space    | 67411.9            | 6.2          | 13   |
| 9                                   | Boardman River           | 280014    | Developed, Open Space    | 9547.1             | 6.1          | 14   |
| 28                                  | Tittabawassee River      | 730025    | Developed, Open Space    | 79461.7            | 5.0          | 15   |
| 13                                  | Muskegon River (Upper)   | 670008    | Developed, Open Space    | 52497.0            | 5.0          | 16   |
| 12                                  | Muskegon River (Lower)   | 610273    | Developed, Open Space    | 77745.1            | 4.9          | 17   |
| 19                                  | St. Joseph River (Upper) | 750273    | Developed, Open Space    | 57181.4            | 4.7          | 18   |
| 26                                  | Cass River               | 730024    | Developed, Open Space    | 27004.3            | 4.7          | 19   |
| 8                                   | Cheboygan River          | 160073    | Developed, Open Space    | 42370.2            | 4.4          | 20   |
| 10                                  | Manistee River           | 510088    | Developed, Open Space    | 48585.2            | 4.4          | 21   |
| 31                                  | Thunder Bay River        | 40123     | Developed, Open Space    | 33503.9            | 4.2          | 22   |
| 24                                  | Black River              | 740267    | Developed, Open Space    | 18365.0            | 4.2          | 23   |
| 11                                  | Pere Marquette River     | 530027    | Developed, Open Space    | 17554.4            | 4.0          | 24   |
| 2                                   | Menominee River          | 550038    | Developed, Open Space    | 77885.1            | 3.0          | 25   |
| 3                                   | Escanaba River           | 210102    | Developed, Open Space    | 6452.3             | 2.8          | 26   |
| 7                                   | Pine River               | 490006    | Developed, Open Space    | 4836.8             | 2.7          | 27   |
| 5                                   | Manistique River         | 770073    | Developed, Open Space    | 20845.9            | 2.2          | 28   |
| 1                                   | Ontonagon River          | 660038    | Developed, Open Space    | 19135.9            | 2.2          | 29   |
| 4                                   | Sturgeon River           | 210032    | Developed, Open Space    | 2950.3             | 2.1          | 30   |
| 6                                   | Tahquamenon River        | 170141    | Developed, Open Space    | 8733.7             | 1.7          | 31   |