U.S. Fish & Wildlife Service

ECOLOGICAL HAZARD ASSESSMENT OF CONTAMINANTS OF EMERGING CONCERN IN THE U.S. GREAT LAKES BASIN

Part A (Volume II of II): Attachments

December 2019

Biological Technical Publication
BTP-R3020-2021

U.S. Fish & Wildlife Service
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ATTACHMENT A –

Exposure Assessment Supplement

A1. Calculation and Application of Sediment-Water Partitioning Coefficient (K_d) Values to Calculate an Aqueous CEC Concentration from Total CEC Concentration in Surface Water Collected at Great Lakes Basin Sampling Sites

Rationale

The USFWS derived surface water screening values for 14 CECs (Gefell et al. 2019) to evaluate relative hazard to fish by comparing to measured CEC concentrations in water at Great Lakes Basin sites sampled during 2010-2014. Screening values are concentrations of aqueous CECs in water that relate to the potential for adverse impacts to fish. However, most of the measured surface water concentration data for these 14 CECs were reported as total concentration (μg/L), which includes both aqueous (dissolved) CEC and CEC adsorbed to particles (see Table 3-1).

This Attachment describes the process by which estimates of aqueous CEC concentrations were computed from total CEC concentrations, in order to obtain metrics of exposure that are comparable to the aqueous CEC SVs.

Approach

For each of the 14 CECs with screening values, we used the following process to estimate aqueous CEC from detected total CEC in surface water samples. CECs identified as non-detects when measured either as aqueous or total CEC concentration in surface water samples were not assigned a concentration, rather, hazard was conservatively assumed to be negligible for all non-detects.

Detected total concentrations were converted to estimates of aqueous concentration, utilizing location- and month-specific historical water quality data and CEC-specific $\log K_{ow}$. A CEC's $\log K_{ow}$ is the log base 10 of the octanol-water partition coefficient (K_{ow}), which is the ratio of CEC concentration in octanol to CEC concentration in pure water at equilibrium, at a specific temperature.

We estimated aqueous CEC concentration from total concentration using the following simplified empirical equation, developed in cooperation with the USGS Upper Midwest Water Science Center:

$$\frac{Cu}{(TSS * Kd) + 1}$$

where,

- C_{aq} = aqueous phase (filtered) CEC concentration, μg/L
- C_u = unfiltered (total) water CEC concentration, μg/L
- TSS = total suspended solids, or, suspended particulate material (SPM), kg/L
- K_d = CEC-specific sediment particle-water partitioning coefficient

Conversion Equation Derivation

The conversion equation was developed as follows:

Definitions

C_u = unfiltered (total) water CEC concentration, ug CEC/L

C_{aq} = aqueous phase (filtered) water CEC concentration, ug CEC/L

C_p = particulate phase CEC concentration, ug particulate CEC per liter of water filtered

TSS = suspended particulate material (or SPM), kg/L

C_s = solid phase CEC concentration, ug CEC per kg sediment particles

Given

$C_u = C_{aq} + C_p$

$K_d = C_s / C_{aq}$

$C_s = C_p / TSS$

Algebraic Derivation

Given $K_d = C_s / C_{aq}$, solve for C_{aq}

If C_u, TSS, and K_d are each measured or estimated, then substitute for C_s:

$K_d = ((C_p / TSS)) / C_{aq}$

Substitute for C_p to obtain one unknown, C_{aq}:

$K_d = ((C_u - C_{aq}) / TSS) / C_{aq}$

Rearrange Terms:

$C_{aq} = (C_u - C_{aq}) / TSS) / K_d$

$C_{aq} = (C_u - C_{aq}) / (TSS * K_d)$

$(C_u - C_{aq}) = C_{aq} * TSS * K_d$

$C_u = (C_{aq} * TSS * K_d) + C_{aq}$

$C_u = C_{aq} * ((TSS * K_d) + 1)$

Isolate C_{aq}: $\boldsymbol{C_{aq} = C_u / (TSS * K_d) + 1}$

Input Variables

The conversion equation requires input variables TSS and K_d, where TSS indicates the concentration of particulate solids in surface water and K_d refers to the degree to which CEC in water partitions to those particles. The original purpose of sampling for environmental CECs was to assess presence, concentration, and distribution of CECs in various environmental compartments, principally whole water and whole sediment at locations across the U.S. Great Lakes Basin. Sample-specific data related to TSS and K_d were not measured in the surface water samples collected during 2010-2014. Values for TSS and K_d were developed from various sources. The following sections detail methods we used to obtain estimates of TSS and K_d to use in the conversion equation.

Total suspended sediment (TSS) (kg/L). We developed TSS estimates by project waterbody and by calendar month (see Table A-1) based on empirical field data that approximately correspond spatially and temporally to CEC sampling events. To achieve approximate spatial correspondence, we mapped historical TSS sampling sites provided in the USEPA STOrage and RETreival (STORET) database[1] in each waterbody, and then identified STORET sites in closest proximity to our CEC surface water sampling sites (see maps with both CEC and STORET sampling sites, by project location, in Attachment A2).

For approximate temporal correspondence, we made the simplifying assumption that suspended sediment concentration

[1]STORET data used in this assessment were downloaded in October 2017 using the web page: https://www.epa.gov/waterdata/water-quality-data-wqx. TOC and DOC were used to compute POC (as TOC-DOC), and fOC was computed as POC/TSS. All units were in mg/L, except fOC which is unitless.

varies in a waterbody with frequency and severity of runoff events and with bank erosion and bedload resuspension, all of which are positively related to flow. Based on preliminary analysis of STORET TSS data from project waterbodies (Figures A1-a to A1-c), we further assumed that the magnitudes of runoff and flow vary seasonally for a given waterbody, but that high and low magnitude flow periods may not coincide in the same calendar months across all waterbodies. For each project waterbody, we obtained TSS concentration by calendar month of sampling, as the geometric mean of all sampling event data reported at the STORET sampling sites in closest proximity to CEC surface water sampling sites. Geometric mean TSS was computed using SAS for Windows 9.4.

Finally, we matched each CEC sampling event with geometric mean TSS by project waterbody and sampling month. Where STORET data were insufficient to compute a month-specific geometric mean TSS value for a waterbody, we substituted for that month an annualized geometric mean TSS value based on data for all months reported for that project waterbody. If fewer than three months' of TSS data were available in STORET to compute an annualized geometric mean for a waterbody, then no TSS value was computed and dissolved CEC was not estimated for that month in that waterbody.

Sediment-Water Partition Coefficient (K_d). A CEC-specific K_d value is defined as the ratio of CEC concentration adsorbed to sediment particles (ug/kg) to CEC concentration dissolved in the water (μg/L). We used the following USEPA (1999) equation to estimate K_d from K_{oc} for each CEC in each sample, since sample-specific empirical K_d values were unavailable:

$$Kd = Koc * fOC$$

where,

- K_{oc} = ratio of CEC concentration adsorbed to (or, absorbed into) organic matter (dry weight basis) to dissolved CEC in water; K_{oc} units (L/kg)
- fOC = mass fraction of organic carbon in sediment particles (unitless)

This approach assumes that the CEC is hydrophobic and non-polar, and preferentially binds to organic particulate matter in water (USEPA 1999). Many pharmaceuticals and other CECs have some polarity when dissolved in water. Since our K_d derivation method assumes non-polarity for these CECs, their K_d values are likely overestimated. The use of an elevated K_d, in turn, would result in an underestimate of dissolved CEC in water samples, that would translate to underestimation of hazard to fish from aqueous CEC exposure (see Chapter 7). Further, this equation is reported to be valid for fOC within the range 0.01 to 0.2 (USEPA 1999). Measured or estimated fOC of particulates in nearly all of our surface water samples fell within this range (Table A-3).

Measured K_d values were located in the literature for three CECs. Conkle et al. (2012) reported empirical K_d values for carbamazepine, DEET and ibuprofen in three wetland sites at intervals over 112 days. Using the Conkle et al. (2012) data, we computed the mean of the three measured K_d values for each CEC on day 14 of monitoring. For these three CECs, the larger value between mean measured and sample-specific estimated K_d was used to compute estimated dissolved CEC in water – another conservative assumption that favors underestimating hazard to fish from aqueous CEC exposure.

Organic carbon partitioning coefficient (K_{oc}). A CEC-specific K_{oc} value is the ratio of concentration of CEC adsorbed to organic matter (dry weight basis) to concentration of dissolved CEC in water. The K_{oc} unit is (ml/g, or, L/kg). We used measured K_{oc} values reported in Roberts et al. (2014) for bisphenol A, estrone and triclosan. For the remaining CECs,

we estimated K_{oc} by taking the antilog$_{10}$ of log$_{10}K_{oc}$ computed with the following equation (USEPA 1996):

$$\log Koc = (0.7919 * \log Kow) + 0.0784$$

USEPA (1996) reports that this regression equation describes a very strong relation between log$_{10}K_{oc}$ and log$_{10}K_{ow}$ ($r^2 = 0.97$) based on pairs of measured K_{oc} and K_{ow} values for a total of 31 legacy contaminants that ranged widely in size and polarity, including BTEX, pesticides, ringed organics (halogenated and unhalogenated) and short-chain organics (halogenated and unhalogenated).

Organic carbon fraction (fOC). Measured fOC values were not located in the USEPA STORET database for locations of interest. However, a number of STORET sites in our project waterbodies provided data on total organic carbon (TOC) (mg/L), dissolved organic carbon (DOC) (mg/L), and/or particulate organic carbon (POC) (mg/L) for surface water samples. Depending on available measured data for a given water sample, an empirical fOC was computed either as POC/TSS or as (TOC - DOC) / TSS, where TSS was expressed in mg/L. However, most samples did not provide sufficient data to compute an empirical fOC value. For these, we developed a regression equation to predict fOC.

Only STORET records at those sites that had measured TSS, TOC, and DOC values were used to generate the fOC geometric mean values by waterbody and month. A preliminary analysis demonstrated that POC and TSS in the retrieved dataset are completely uncorrelated, and that TOC and TSS are also uncorrelated, reducing the risk of systematic bias in the calculation fOC = POC/TSS.

We computed the geometric means of TSS and fOC from STORET empirical data by project waterbody and month, and identified 31 waterbody-months having both values. Paired geometric mean values were available for a few calendar months from each of the Milwaukee River, Genesee River, Oswegatchie River and Raquette River. Using SAS for Windows 9.4, we regressed log$_e$(geometric mean fOC) on log$_e$(geometric mean TSS) ($r^2 = 0.63$; $p < 0.0001$; $N = 31$), and obtained the following equation that we used to predict fOC from TSS for waterbody-months with no empirical fOC values in STORET:

$$\ln(\text{geomean fOC}) = -1.396 - (0.905 * \ln(\text{geomean TSS}))$$

Table A-1 shows STORET TOC and DOC data availability for estimating fOC. Surface water sampling months by sampling site are provided in Table A-2. fOC values for calculating K_d by sampling site and month are reported by waterbody (project location or reach) and surface water sampling month in Table A-3. The larger value between measured K_d values reported in literature and estimated K_d are provided in Table A-4, by waterbody, month, and CEC.

Table A-1. Availability of sufficient data in the USEPA STORET database for estimating geometric mean TSS and fOC by waterbody and calendar month (where Month 1 = January, Month 2 = February, etc.).

Waterbody	Sub-Location	STORET Data Availability		Calendar Month with STORET Data (N >= 5)											
		Empirical TOC and DOC	Empirical TSS	1	2	3	4	5	6	7	8	9	10	11	12
01. St. Louis River	St. Louis Bay/Duluth Harbor/Superior Bay		●	●	●	●	●	●	●	●	●	●	●	●	●
	Upper St. Louis River		●	●	●	●	●	●	●	●	●	●	●	●	●
	Lower St. Louis River		●	●	●	●	●	●	●	●	●	●	●	●	●
02. Waupaca Chain O'Lakes			●			●	●	●	●	●	●	●			
03. Little Lake Butte des Morts			●	●	●	●	●	●	●	●	●	●	●	●	●
04. Fox River	Lower Fox River		●	●	●	●	●	●	●	●	●	●	●	●	●
	Lower Green Bay		●	●	●	●	●	●	●	●	●	●	●	●	●
05. Kewaunee River			●	●	●		●			●	●	●	●		
06. Milwaukee River		X	●	●	●	●	●	●	●	●	●	●	●	●	●
07. North Shore Channel			●	●	●	●	●	●	●	●	●	●	●	●	●
08. Little Calumet River			●			●	●	●	●	●	●	●	●	●	●
09. Grand River	Upper Grand River		●								●				
	Lower Grand River		●		●	●	●	●	●	●	●	●	●	●	
	Maple River		●					●		●			●	●	
10. Saginaw River			●			●	●	●	●	●	●	●	●	●	
11. St. Clair River			●				●	●	●	●	●	●	●	●	
12. Clinton River			●			●	●	●	●	●	●	●	●	●	
13. Detroit River			●				●	●	●	●	●	●	●	●	
14. River Raisin			●				●	●	●	●	●	●	●	●	
15. Swan Creek (tributary of Maumee River)			●						●	●	●				
16. Maumee River			●			●	●	●	●	●	●	●	●		●
17. Cuyahoga River			●			●		●	●	●	●	●			
18. Tinkers Creek			●			●			●	●			●		
19. Ashtabula River			●				●	●	●	●	●	●	●	●	
20. Long Pond (Northrup Creek)															
21. Genesee River		X	●				●	●	●	●	●	●	●		
22. Irondequoit Bay (Irondequoit Creek)			●						●	●					
23. Oswegatchie River		X	●				●	●	●	●	●	●	●	●	
24. Raquette River		X	●				●	●	●	●	●		●	●	

Table A-2. Complete list of 2010-2014 surface water sampling sites used in this hazard assessment, distributed among 24 project locations across the U.S. Great Lakes Basin.

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
01. St. Louis River/Bay	> **BlatnikBr**	46.751111	-92.0975	DS-distal	Y	2			09		
01. St. Louis River/Bay	CloquetDW	46.848611	-92.576667	US	N	2			09		
01. St. Louis River/Bay	CloquetUP	46.854444	-92.573056	US	N	2			09		
01. St. Louis River/Bay	CloughId	46.696111	-92.184444	US	Y	2			09		
01. St. Louis River/Bay	> **EriePr**	46.74	-92.148056	DS-distal	Y	8			05,09		
01. St. Louis River/Bay	FDL	46.658611	-92.2825	US	Y	4	09				
01. St. Louis River/Bay	FondDu	46.6675	-92.2875	US	Y	2			09		
01. St. Louis River/Bay	GrassyPt	46.726667	-92.148333	DS-distal	Y	6			05,09		
01. St. Louis River/Bay	> **HogIsland**	46.707778	-92.036667	DS-distal	Y	5			05		
01. St. Louis River/Bay	MudLk	46.658333	-92.202778	US	Y	2			09		
01. St. Louis River/Bay	NekukId	46.655833	-92.273056	US	Y	2			09		
01. St. Louis River/Bay	> **RicesPt**	46.773056	-92.103889	DS-distal	Y	8			05,09		
01. St. Louis River/Bay	> **SMTP**	46.728611	-92.068333	proximal	Y	10	09		05		
01. St. Louis River/Bay	> **STB-MP-1**	46.7345	-92.152361	DS-distal	Y	1	09				
01. St. Louis River/Bay	> **STB-MP-2**	46.733056	-92.155278	DS-distal	Y	1	09				
01. St. Louis River/Bay	> **STB-MP-3**	46.730972	-92.155	DS-distal	Y	1	09				
01. St. Louis River/Bay	> **STB-MP-4**	46.730361	-92.152756	DS-distal	Y	1	09				
01. St. Louis River/Bay	> **STB-MP-5**	46.731	-92.150972	DS-distal	Y	1	09				

[2] In lotic systems (including impoundments within river systems), designations were upstream (US), downstream (DS), or DS-distal. Downstream (DS) sites were within 4 linear kilometers downstream of the nearest upgradient point source (wastewater treatment plant or CSO). DS-distal sites were more than 4 linear km downstream of the nearest upgradient point source. In lentic systems, sampling sites that were within 1 linear km of the nearest point source in any direction were designated "proximal"; the designation was "distal" if greater than 1 km from a point source. We designated sampling sites as 'point source CEC-influenced' if their orientation to point sources was 'DS' in lotic systems or 'proximal' in lentic systems. We designated sites as 'uninfluenced' if their orientation to point sources was 'US' or 'DS-distal' in lotic systems, or 'distal' in lentic systems. Sites within impoundments in lotic systems were considered lotic sites.

Table A-2. **(Continued)**

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
01. St. Louis River/Bay	> **STB-MP-6**	46.732389	-92.151583	DS-distal	Y	1	09				
01. St. Louis River/Bay	> **STB-WLSSD-1/WLSSD-Far Dist**	46.754806	-92.120528	proximal	Y	6	09	08,09			
01. St. Louis River/Bay	> **STB-WLSSD-2**	46.755778	-92.119694	proximal	Y	1	09				
01. St. Louis River/Bay	> **STB-WLSSD-3**	46.756333	-92.121361	proximal	Y	1	09				
01. St. Louis River/Bay	> **STB-WLSSD-5**	46.757583	-92.121278	proximal	Y	1	09				
01. St. Louis River/Bay	STR-FDL-1	46.659306	-92.283667	US	Y	1	09				
01. St. Louis River/Bay	STR-FDL-2	46.660194	-92.28325	US	Y	1	09				
01. St. Louis River/Bay	STR-FDL-3	46.660778	-92.28525	US	Y	1	09				
01. St. Louis River/Bay	STR-FDL-4	46.65875	-92.283611	US	Y	1	09				
01. St. Louis River/Bay	STR-FDL-5	46.659639	-92.285889	US	Y	1	09				
01. St. Louis River/Bay	STR-FDL-6	46.660306	-92.28675	US	Y	1	09				
01. St. Louis River/Bay	TallasId	46.71	-92.1975	US	Y	2			09		
01. St. Louis River/Bay	> **STB-WLSSD-4/WLSSD-DISTAL**	46.755278	-92.121111	proximal	Y	19	09	08,09	05,09		
01. St. Louis River/Bay	WireMi	46.675833	-92.196944	US	Y	2			09		
02. Waupaca Chain O' Lakes	COL-1	44.338056	-89.148056	distal	N	2			04		
02. Waupaca Chain O' Lakes	COL-2	44.346389	-89.151944	distal	N	2			04		
03. Little Lake Butte des Morts	LLB-1	44.1847222	-88.449444	US	N	4				08	05,08
03. Little Lake Butte des Morts	> **LLB-2**	44.2175	-88.461389	DS	N	8				08	05,08
03. Little Lake Butte des Morts	> **LLB-3**	44.229694	-88.45875	DS	N	8				08	05,08
03. Little Lake Butte des Morts	> **LLB-4**	44.2416667	-88.444167	DS	N	4				08	05,08
03. Little Lake Butte des Morts	> **LLB-5**	44.242222	-88.446361	DS	N	4				08	05,08

Table A-2. **(Continued)**

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
04. Fox River / Green Bay	> **DPERE-9**	44.461944	-88.059444	DS	Y	3		06	04		
04. Fox River / Green Bay	EASTR-10	44.517222	-88.006667	DS-distal	N	3		06	04		
04. Fox River / Green Bay	> **FXR-1**	44.538583	-88.003944	proximal	Y	1	10				
04. Fox River / Green Bay	> **FXR-13**	44.333056	-88.156389	DS	N	4			04		05,08
04. Fox River / Green Bay	> **FXR-14**	44.357222	-88.143889	DS	N	1			04		
04. Fox River / Green Bay	> **FXR-2**	44.541139	-87.991806	proximal	Y	1	10				
04. Fox River / Green Bay	> **FXR-3**	44.546722	-87.959389	distal	Y	1	10				
04. Fox River / Green Bay	FXR-4	44.57325	-87.978972	distal	Y	1	10				
04. Fox River / Green Bay	FXR-5	44.590806	-87.999167	distal	Y	2	10		04		
04. Fox River / Green Bay	FXR-6	44.533861	-88.006667	DS-distal	Y	1	10				
04. Fox River / Green Bay	> **GRBAY-12**	44.539444	-88.004444	proximal	Y	3		06	04		
04. Fox River / Green Bay	LBM-1	44.035444	-88.565694	DS-distal	N	3					05,08
04. Fox River / Green Bay	LKP-1	44.1108333	-88.710278	US	N	3					05,08
04. Fox River / Green Bay	> **LLB-6**	44.269944	-88.365694	DS	N	8				08	05,08
04. Fox River / Green Bay	PRGAM-11	44.528611	-88.01	DS-distal	Y	2		06			
05. Kewaunee River	KWE-1	44.5741667	-87.684722	US	N	3				05	04,08
05. Kewaunee River	> **KWE-2**	44.5558333	-87.661944	DS	N	3				05	04,08
05. Kewaunee River	> **KWE-3**	44.5391667	-87.638333	DS	N	5				05	04,08
05. Kewaunee River	KWE-4	44.4641667	-87.558056	DS-distal	N	3				05	04,08
05. Kewaunee River	> **KWE-5**	44.4625	-87.5025	DS	N	5				05	04,08
06. Milwaukee River	> **JISLA-15**	43.023056	-87.893889	proximal	Y	2		06			

Table A-2. **(Continued)**

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
06. Milwaukee River	> **KINNI-17**	43.008056	-87.909167	DS	Y	2		06			
06. Milwaukee River	> **MENMR-13**	43.0325	-87.929167	DS	Y	2		06			
06. Milwaukee River	> **MILWR-14**	43.034444	-87.910278	DS	Y	2		06			
07. North Shore Channel	> **CHI-112**	42.040861	-87.709778	DS	N	3					04,05 ,09
07. North Shore Channel	> **CHI-36**	42.011778	-87.710389	DS	N	3					04,05 ,09
07. North Shore Channel	> **CHI-RP4**	42.021806	-87.710417	DS	N	6					04,05 ,09
08. Little Calumet River	> **CHI-56**	41.650917	-87.615583	DS	N	3					04,05 ,09
08. Little Calumet River	> **CHI-76**	41.656528	-87.636472	DS	N	3					04,05 ,09
08. Little Calumet River	> **CHI-RP7**	41.662361	-87.619083	DS	N	6					04,05 ,09
09. Grand/Maple River	GRAND-3	42.9844444	-84.945833	DS-distal	N	3				05	04,08
09. Grand/Maple River	GRAND-4	42.8388889	-85.0475	US	N	2				05	08
09. Grand/Maple River	GRAND-5	42.9680556	-85.101667	DS-distal	N	3				05	04,08
09. Grand/Maple River	> **GRAND-6**	42.9444444	-85.714444	DS	N	3					04,08
09. Grand/Maple River	MAPLE-1	43.0897222	-84.405833	US	N	3				05	04,08
09. Grand/Maple River	> **MAPLE-2**	43.105	-84.706389	DS	N	3				05	04,08
10. Saginaw River	SGNR-1	43.1080556	-83.6175	US	N	2					04,08
10. Saginaw River	> **SGNR-10**	43.4208333	-83.9725	DS	Y	2					04,08
10. Saginaw River	> **SGNR-11**	43.4891667	-83.921667	DS	Y	2					04,08
10. Saginaw River	> **SGNR-12**	43.62	-83.851944	DS	Y	2					04,08
10. Saginaw River	SGNR-13	43.6675	-83.845833	distal	Y	2					04,08

Table A-2. **(Continued)**

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
10. Saginaw River	SGNR-14	43.9958333	-83.476389	distal	Y	2					05,08
10. Saginaw River	> **SGNR-2**	43.0344444	-83.777222	DS	N	2					04,08
10. Saginaw River	SGNR-3	43.3719444	-84.015556	US	N	2					04,08
10. Saginaw River	SGNR-4	43.5838889	-83.175278	US	N	2					04,08
10. Saginaw River	> **SGNR-5**	43.3286111	-83.758333	DS	N	2					04,08
10. Saginaw River	SGNR-6	43.935	-84.300278	US	N	2					04,08
10. Saginaw River	SGNR-7	43.5869444	-84.513889	DS-distal	N	2					04,08
10. Saginaw River	SGNR-8	43.5641667	-84.369444	DS-distal	N	2					04,08
10. Saginaw River	> **SGNR-9**	43.5691667	-84.195	DS	N	2					04,08
11. St. Clair River	> **SCR-1**	42.9722222	-82.418611	DS	Y	2				08	
11. St. Clair River	> **SCR-2**	42.9052778	-82.466667	DS	Y	1				08	
11. St. Clair River	> **SCR-3**	42.82	-82.485278	DS	Y	2				08	
11. St. Clair River	> **SCR-4**	42.7013889	-82.5	DS	Y	1				08	
11. St. Clair River	> **SCR-5**	42.6122222	-82.551389	DS	Y	2				08	
11. St. Clair River	SCR-6	42.6422222	-82.668333	DS-distal	Y	1				08	
11. St. Clair River	SCR-7	42.5933333	-82.637778	DS-distal	Y	1				08	
11. St. Clair River	SCR-8	42.5316667	-82.675	DS-distal	Y	1				08	
12. Clinton River	> **CLI-1-DOWN**	42.597056	-82.862583	DS	Y	2				06	
12. Clinton River	CLI-2-CAPT	42.597694	-82.86725	US	Y	2				06	
12. Clinton River	> **CLI-3-WWTP**	42.637444	-83.252944	DS	Y	2				06	
12. Clinton River	CLI-4-STONY	42.736083	-83.071889	US	Y	2				06	

Table A-2. (**Continued**)

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
12. Clinton River	CLI-5-CASS	42.617306	-83.373944	US	Y	2				06	
13. Detroit River	> DTR-1	42.293778	-83.098778	DS	Y	2	10		05		
13. Detroit River	> DTR-2	42.2735	-83.110056	DS	Y	2	10		05		
13. Detroit River	DTR-3	42.205194	-83.146	US	Y	2	10		05		
13. Detroit River	> DTR-4	42.113833	-83.18325	DS	Y	1	10				
13. Detroit River	DTR-5	42.085833	-83.177444	distal	Y	1	10				
13. Detroit River	DTR-6	42.073306	-83.184444	distal	Y	1	10				
13. Detroit River	**> GROSIL-3**	42.127222	-83.173056	DS	Y	2		04,05			
13. Detroit River	PTHENN-1	42.2025	-83.142222	US	Y	2		04,05			
13. Detroit River	**> TRENTN-4**	42.120556	-83.18	DS	Y	2		04,05			
13. Detroit River	WYAND-2	42.183333	-83.135556	US	Y	2		04,05			
14. River Raisin	RRR-1	41.92375	-83.421556	US	N	1			05		
14. River Raisin	RRR-2	41.909806	-83.377278	US	Y	1			05		
14. River Raisin	**> RRR-3**	41.900528	-83.361889	DS	Y	1			05		
14. River Raisin	**> RRR-4**	41.894556	-83.344806	DS	Y	1			05		
15. Swan Creek	**> SWC-1**	41.636861	-83.570667	DS	Y	1	10				
15. Swan Creek	**> SWC-2**	41.636861	-83.5695	DS	Y	1	10				
15. Swan Creek	**> SWC-3**	41.636944	-83.568194	DS	Y	1	10				
15. Swan Creek	**> SWC-4**	41.636583	-83.566806	DS	Y	1	10				
15. Swan Creek	**> SWC-5**	41.637333	-83.563139	DS	Y	1	10				
15. Swan Creek	**> SWC-6**	41.64125	-83.56275	DS	Y	1	10				

Table A-2. (**Continued**)

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
15. Swan Creek	> **SWC-7**	41.643028	-83.56225	DS	Y	2	10	04			
15. Swan Creek	> **SWC-8**	41.6415	-83.557306	DS	Y	2	10	04			
15. Swan Creek	> **SWC-9**	41.642611	-83.552056	DS	Y	3	10		09		
15. Swan Creek	> **SWC-10**	41.642917	-83.549639	DS	Y	2	10		09		
15. Swan Creek	> **SWC-11**	41.641861	-83.545611	DS	Y	2	10	04			
15. Swan Creek	> **SWC-12**	41.6445	-83.543083	DS	Y	1	10				
15. Swan Creek	> **SWC-CP-8**	41.642222	-83.547778	DS	Y	1			09		
16. Maumee River	CLARKO-6	41.683056	-83.484722	US	Y	2		04,05			
16. Maumee River	> **MAU-BVP**	41.693361	-83.471944	DS	Y	1			04		
16. Maumee River	> **MAU-CSO-68**	41.655639	-83.523917	DS	Y	1			09		
16. Maumee River	> **MAU-CSO-9**	41.624444	-83.533889	DS	Y	2			09		
16. Maumee River	> **MAU-DS-CSO-9**	41.6275	-83.532222	DS	Y	1			09		
16. Maumee River	> **MAU-DS-PB-WWTP**	41.559806	-83.639167	DS	Y	2			09		
16. Maumee River	> **MAU-DS-WWTP**	41.690556	-83.476472	DS	Y	1			04		
16. Maumee River	> **MAU-Distal-DS-WWTP**	41.691056	-83.474528	DS	Y	5			09		
16. Maumee River	> **MAU-GR-1**	41.430333	-83.827056	DS	N	1			04		
16. Maumee River	> **MAU-LASALLE**	41.68525	-83.482389	DS	Y	1			04		
16. Maumee River	> **MAU-N-EW-PB-WWTP**	41.570417	-83.637611	DS	Y	1			09		
16. Maumee River	MAU-PB-WWTP	41.5575	-83.649722	US	Y	1			09		
16. Maumee River	> **MAU-TOL-WWTP**	41.68725	-83.479611	DS	Y	1			04		
16. Maumee River	MAU-US-CSO-9	41.623611	-83.538056	US	Y	1			09		

Table A-2. (**Continued**)

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
16. Maumee River	MAU-US-WWTP	41.683611	-83.485556	US	Y	5			09		
16. Maumee River	> **MAU-WAT-1**	41.476472	-83.749056	DS	N	1			04		
16. Maumee River	> **MAU-WAT-2**	41.477472	-83.748167	DS	N	1			04		
16. Maumee River	> **MX-WWTP**	41.688889	-83.477222	DS	Y	5			09		
16. Maumee River	> **SWANC-5**	41.647778	-83.534167	DS	Y	5		04,05	09		
16. Maumee River	> **TOLEDO-7**	41.688611	-83.475	DS	Y	3		04,05			
17. Cuyahoga River	CUY-1-ROCK	41.393944	-81.629778	DS-distal	Y	5				06	04,05 ,08
17. Cuyahoga River	CUY-2-BOLANZ	41.200861	-81.568556	DS-distal	Y	5				06	04,05 ,08
17. Cuyahoga River	> **CUY-3-WWTP**	41.159944	-81.572833	DS	Y	8				06	04,05 ,08
17. Cuyahoga River	> **CUY-4-UP**	41.135194	-81.546972	DS	Y	5				06	04,05 ,08
17. Cuyahoga River	> **CUY-5-LaDUE**	41.387222	-81.200472	proximal	N	5				06	04,05 ,08
18. Tinkers Creek	TIC-1	41.2397222	-81.378611	US	Y	3				08	04,08
18. Tinkers Creek	> **TIC-2**	41.2619444	-81.393889	DS	Y	3				08	04,08
18. Tinkers Creek	TIC-3	41.2852778	-81.405556	DS-distal	Y	3				08	04,08
18. Tinkers Creek	> **TIC-4**	41.325	-81.448056	DS	Y	3				08	04,08
18. Tinkers Creek	> **TIC-5**	41.3683333	-81.460833	DS	Y	6				08	04,08
18. Tinkers Creek	> **TIC-6**	41.3627778	-81.470833	DS	Y	3				08	04,08
18. Tinkers Creek	> **TIC-7**	41.3838889	-81.5125	DS	Y	3				08	04,08
18. Tinkers Creek	> **TIC-8**	41.3863889	-81.56278	DS	Y	6				08	04,08
18. Tinkers Creek	TIC-9	41.3647222	-81.608333	DS-distal	Y	3				08	04,08

Table A-2. (**Continued**)

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources [2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
19. Ashtabula River	ASH-1	41.897778	-80.793333	US	Y	1		04			
19. Ashtabula River	ASH-2	41.895833	-80.796111	US	Y	1		04			
19. Ashtabula River	ASH-3	41.891111	-80.798056	US	Y	1		04			
20. Long Pond	LP01	43.28825	-77.706917	DS-distal	N	1			04		
20. Long Pond	LP02	43.283861	-77.697778	DS-distal	N	1			04		
20. Long Pond	LP04	43.291194	-77.677833	DS-distal	N	1			04		
20. Long Pond	LP06	43.296944	-77.683778	DS-distal	N	1			04		
20. Long Pond	LP06-REF	43.255472	-77.791056	US	N	1			04		
20. Long Pond	LP_South	43.284722	-77.704528	DS-distal	N	1			04		
21. Genesee River	GNR-1	43.198086	-77.621519	DS	Y	2	09	05			
21. Genesee River	> **GNR-2**	43.201333	-77.623833	DS	Y	2	09	05			
21. Genesee River	> **GNR-3**	43.207278	-77.6265	DS	Y	1	09				
21. Genesee River	> **GNR-4**	43.22775	-77.616417	DS	Y	1	09				
21. Genesee River	> **GNR-5**	43.234028	-77.617917	DS	Y	1	09				
21. Genesee River	GNR-6	43.256556	-77.605972	DS-distal	Y	2	09	05			
22. Irondequoit Bay	IB04	43.184083	-77.518556	DS-distal	N	1			04		
22. Irondequoit Bay	IB05	43.179222	-77.528222	DS-distal	N	1			04		
22. Irondequoit Bay	IB06	43.177667	-77.527833	DS-distal	N	1			04		
22. Irondequoit Bay	IB06_REF	43.173333	-77.519667	US	N	1			04		
22. Irondequoit Bay	IB_NE_DUNE	43.192361	-77.517444	DS-distal	N	1			04		
22. Irondequoit Bay	IB_NW_PHRAG	43.191417	-77.528944	DS-distal	N	1			04		

Table A-2. (**Continued**)

Project Location (ordered West to East)	Site Name (ordered alphabetically within Project Locations; Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source)	Latitude	Longitude	Orientation to CEC Point Sources[2]	Area of Concern Water Sampling Site	Total # Surface Water Samples	Sampling Schedule [Months designated by numerals: January = 01 … December = 12]				
							2010	2011	2012	2013	2014
23. Oswegatchie River	OSW-1	44.187778	-74.787778	US	N	5				08	05,08
23. Oswegatchie River	**> OSW-2**	44.148333	-74.898889	DS	N	7				08,10	05,08
23. Oswegatchie River	OSW-3	44.218333	-74.953611	DS-distal	N	6				08,10	05,08
23. Oswegatchie River	OSW-4	44.2125	-75.0075	DS-distal	N	6				08,10	05,08
23. Oswegatchie River	**> OSW-5**	44.314722	-75.269444	DS	N	7				08,10	05,08
24. Raquette River	**> RAQ-1-NOR**	44.723843	-74.989601	DS	N	8				06,07	05,08
24. Raquette River	**> RAQ-2-WWTP**	44.682754	-74.996702	DS	N	8				06,07	05,08
24. Raquette River	RAQ-3	44.6799	-74.994173	US	N	6					05,08
24. Raquette River	RAQ-4-PIERCE	44.233938	-74.529803	DS-distal	N	8				06,07	05,08
24. Raquette River	**> RAQ-5-RAQ**	44.231799	-74.479225	DS	N	8				06,07	05,08
24. Raquette River	RAQ-6-TUPPER	44.125162	-74.538418	distal	N	8				06,07	05,08

Table A-3. Estimated fraction organic carbon (fOC) in suspended particles in each project location reach during months when surface water was sampled.

Project Location Reach	fOC Values for K_d computation, by Month						
	04	05	06	07	08	09	10
01. Lower St. Louis River		0.033				0.051	
01. St. Louis Bay/Duluth Harbor/Superior Bay		0.035			0.047	0.039	
01. Upper St. Louis River						0.052	
02. Waupaca Chain O'Lakes	0.040						
03. Little Lake Butte des Morts		0.029			0.016		
04. Fox River	0.029	0.021	0.017		0.012		
04. Lower Green Bay	0.015						0.011
05. Kewaunee River	0.046	0.040			0.019		
06. Milwaukee River			0.018				
07. North Shore Channel	0.037	0.031				0.049	
08. Little Calumet River	0.041	0.058				0.047	
09. Lower Grand River	0.014	0.01			0.015		
09. Maple River	0.050	0.047			0.050		
09. Upper Grand River	0.010	0.010			0.010		
10. Saginaw River	0.013	0.01			0.018		
11. St. Clair River					0.057		
12. Clinton River			0.015				
13. Detroit River	0.043	0.038					0.037
14. River Raisin		0.012					
15. Swan Creek (tributary of Maumee River)	0.025					0.025	0.025
16. Maumee River	0.009	0.016				0.014	
17. Cuyahoga River	0.016	0.024	0.008		0.021		
18. Tinkers Creek	0.014				0.014		
19. Ashtabula River	0.021						
20. Long Pond	0.041						
21. Genesee River		0.007				0.003	
22. Irondequoit Bay	0.039						
23. Oswegatchie River		0.053			0.011		0.026
24. Raquette River		0.333	0.077	0.385	0.227		

Table A-4. Sorption coefficients (K_d) used in estimating sample-specific aqueous CEC concentrations from total CEC in surface water. Values in this table are the larger value between measured K_d values reported in literature and estimated K_d computed by project location reach, month, and CEC. Values are over-precise, but were carried through subsequent calculations as presented here.

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
01. Lower St. Louis River - 05	6.03	163.63	8.66	23.65	2.13	15.55	105.65	1881.34	55.73	3.42	1754256.74	37.31	121.30	13.69
01. Lower St. Louis River - 09	9.16	248.66	8.66	35.95	3.24	23.63	160.55	2859.07	84.69	5.20	2665934.79	56.71	184.34	20.80
01. St. Louis Bay/Duluth Harbor/Superior Bay - 05	6.24	169.37	8.66	24.48	2.21	16.10	109.36	1947.40	57.69	3.54	1815846.36	38.63	125.56	14.17
01. St. Louis Bay/Duluth Harbor/Superior Bay - 08	8.42	228.56	8.66	33.04	2.98	21.72	147.57	2627.95	77.85	4.78	2450432.02	52.12	169.44	19.12
01. St. Louis Bay/Duluth Harbor/Superior Bay - 09	7.09	192.43	12.76	27.82	2.51	18.29	124.25	2212.53	65.54	4.03	2063072.08	43.88	142.65	16.10
01. Upper St. Louis River - 09	9.33	253.26	8.66	36.61	3.30	24.07	163.52	2911.87	86.26	5.30	2715166.70	57.75	187.74	21.19
02. Waupaca Chain O'Lakes - 04	7.24	196.71	8.66	28.44	2.56	18.70	127.01	2261.73	67.00	4.12	2108951.81	44.86	145.82	16.46
03. Little Lake Butte des Morts - 05	5.23	141.96	8.66	20.52	1.85	13.49	91.66	1632.19		2.97	1521933.41	32.37	105.24	11.88
03. Little Lake Butte des Morts - 08	2.93	79.54	8.66	11.50	1.73	7.56	51.36	914.58		1.66	852798.77	18.14	58.97	6.65
04. Fox River - 04	5.17	140.36	8.66	20.29	1.83	13.34	90.62	1613.78	47.81	2.94	1504768.32	32.01	104.05	11.74
04. Fox River - 05	3.71	100.71	8.66	14.56	1.73	9.57	65.02	1157.91		2.11	1079690.04	22.97	74.66	8.42
04. Fox River - 06	3.00	81.38	8.66	11.76	1.73	7.73	52.54	935.65	27.72	1.70	872445.13	18.56	60.33	6.81
04. Fox River - 08	2.13	57.90	8.66	8.37	1.73	5.50	37.38	665.66		1.21	620692.95	13.20	42.92	4.84

Table A-4. **(continued)**

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
04. Lower Green Bay - 04	2.64	71.60	8.66	10.35	1.73	6.80	46.23	823.18	24.39	1.50	767574.58	16.33	53.07	5.99
04. Lower Green Bay - 10	2.05	55.68	8.66	8.05	1.73	5.29	35.95	640.14	18.96	1.16	596899.71	12.70	41.27	4.66
05. Kewaunee River - 04	8.30	225.43	8.66	32.59	2.94	21.43	145.55	2591.92		4.72	2416830.82	51.41	167.11	18.86
05. Kewaunee River - 05	7.28	197.70	8.66	28.58	2.57	18.79	127.65	2273.14		4.14	2119590.30	45.09	146.56	16.54
05. Kewaunee River - 08	3.41	92.62	8.66	13.39	1.73	8.80	59.80	1064.88		1.94	992948.84	21.12	68.66	7.75
06. Milwaukee River - 06	3.30	89.64	8.66	12.96	1.73	8.52	57.87	1030.61	30.53	1.88	960989.57	20.44	66.45	7.50
07. North Shore Channel - 04	6.57	178.53	8.66	25.81	2.33	16.97	115.27	2052.71		3.74	1914046.18	40.71	132.35	14.93
07. North Shore Channel - 05	5.60	152.06	8.66	21.98	1.98	14.45	98.18	1748.30		3.18	1630196.49	34.68	112.72	12.72
07. North Shore Channel - 09	8.83	239.79	8.66	34.66	3.12	22.79	154.82	2756.98		5.02	2570745.60	54.68	177.76	20.06
08. Little Calumet River - 04	7.43	201.75	8.66	29.17	2.63	19.18	130.26	2319.71		4.22	2163011.09	46.01	149.56	16.88
08. Little Calumet River - 05	10.39	282.09	8.66	40.78	3.67	26.81	182.13	3243.39		5.90	3024298.95	64.33	209.12	23.60
08. Little Calumet River - 09	8.52	231.48	8.66	33.46	3.01	22.00	149.46	2661.53		4.84	2481743.48	52.79	171.60	19.36
09. Lower Grand River - 04	2.52	68.39	8.66	9.89	1.73	6.50	44.15	786.29		1.43	733171.32	15.60	50.70	5.72

Table A-4. (**continued**)

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
09. Lower Grand River - 05	1.79	48.56	8.66	7.02	1.73	4.62	31.35	558.34		1.02	520623.45	11.07	36.00	4.06
09. Lower Grand River - 08	2.63	71.31	8.66	10.31	1.73	6.78	46.04	819.91		1.49	764524.49	16.26	52.86	5.97
09. Maple River - 04	9.09	246.92	8.66	35.70	3.22	23.47	159.43	2839.05		5.17	2647267.28	56.31	183.05	20.66
09. Maple River - 05	8.42	228.72	8.66	33.06	2.98	21.74	147.67	2629.74		4.79	2452095.65	52.16	169.55	19.13
09. Maple River - 08	9.09	246.92	8.66	35.70	3.22	23.47	159.43	2839.05		5.17	2647267.28	56.31	183.05	20.66
09. Upper Grand River - 04	1.84	49.86	8.66	7.21	1.73	4.74	32.19	573.25		1.04	534529.26	11.37	36.96	4.17
09. Upper Grand River - 05	1.84	49.86	8.66	7.21	1.73	4.74	32.19	573.25		1.04	534529.26	11.37	36.96	4.17
09. Upper Grand River - 08	1.84	49.86	8.66	7.21	1.73	4.74	32.19	573.25		1.04	534529.26	11.37	36.96	4.17
10. Saginaw River - 04	2.27	61.63	8.66	8.91	1.73	5.86	39.79	708.58		1.29	660711.26	14.05	45.69	5.16
10. Saginaw River - 05	1.79	48.64	8.66	7.03	1.73	4.62	31.41	559.29		1.02	521510.47	11.09	36.06	4.07
10. Saginaw River - 08	3.27	88.73	8.66	12.83	1.73	8.43	57.29	1020.16		1.86	951245.06	20.23	65.77	7.42
11. St. Clair River - 08	10.38	281.87	8.66	40.75	3.67	26.79	181.99	3240.90		5.90	3021976.35	64.28	208.96	23.58
12. Clinton River - 06	2.77	75.13	8.66	10.86	1.73	7.14	48.50	863.76		1.57	805416.48	17.13	55.69	6.28

Table A-4. (**continued**)

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
13. Detroit River - 04	7.74	210.09	8.66	30.37	2.74	19.97	135.64	2415.50	71.55	4.40	2252327.05	47.91	155.74	17.57
13. Detroit River - 05	6.89	187.00	8.66	27.03	2.44	17.77	120.74	2150.03	63.69	3.91	2004788.97	42.64	138.62	15.64
13. Detroit River - 10	6.64	180.36	8.66	26.07	2.35	17.14	116.45	2073.71	61.43	3.77	1933628.48	41.13	133.70	15.09
14. River Raisin - 05	2.12	57.45	8.66	8.31	1.73	5.46	37.10	660.59	19.57	1.20	615964.48	13.10	42.59	4.81
15. Swan Creek (tributary of Maumee River) - 04	4.59	124.64	8.66	18.02	1.73	11.85	80.48	1433.09	42.45	2.61	1336280.17	28.42	92.40	10.43
15. Swan Creek (tributary of Maumee River) - 09	4.59	124.64	8.66	18.02	1.73	11.85	80.48	1433.09	42.45	2.61	1336280.17	28.42	92.40	10.43
15. Swan Creek (tributary of Maumee River) - 10	4.59	124.64	8.66	18.02	1.73	11.85	80.48	1433.09		2.61	1336280.17	28.42	92.40	10.43
16. Maumee River - 04	1.63	44.17	8.66	6.38	1.73	4.20	28.52	507.80	15.04	0.92	473499.86	10.07	32.74	3.69
16. Maumee River - 05	2.82	76.67	8.66	11.08	1.73	7.29	49.50	881.51	26.11	1.60	821967.46	17.48	56.84	6.41
16. Maumee River - 09	2.60	70.52	8.66	10.19	1.73	6.70	45.53	810.86	24.02	1.48	756087.60	16.08	52.28	5.90
17. Cuyahoga River - 04	2.92	79.23	8.66	11.45	1.73	7.53	51.16	911.00		1.66	849456.63	18.07	58.74	6.63
17. Cuyahoga River - 05	4.24	115.12	8.66	16.64	1.73	10.94	74.33	1323.66		2.41	1234244.09	26.25	85.34	9.63
17. Cuyahoga River - 06	1.35	36.74	8.66	5.31	1.73	3.49	23.72	422.37		0.77	393841.95	8.38	27.23	3.07

Table A-4. (**continued**)

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
17. Cuyahoga River - 08	3.81	103.38	8.66	14.94	1.73	9.83	66.75	1188.59		2.16	1108300.50	23.57	76.63	8.65
18. Tinkers Creek - 04	2.56	69.49	8.66	10.05	1.73	6.60	44.87	798.99		1.45	745013.28	15.85	51.51	5.81
18. Tinkers Creek - 08	2.56	69.49	8.66	10.05	1.73	6.60	44.87	798.99	23.67	1.45	745013.28	15.85	51.51	5.81
19. Ashtabula River - 04	3.84	104.22	8.66	15.07	1.73	9.91	67.29	1198.34	35.50	2.18	1117390.31	23.77	77.26	8.72
20. Long Pond - 04	7.39	200.64	8.66	29.00	2.61	19.07	129.54	2306.89	68.34	4.20	2151060.94	45.76	148.74	16.78
21. Genesee River - 05	1.22	33.14	8.66	4.79	1.73	3.15	21.40	381.07	11.29	0.69	355331.63	7.56	24.57	2.77
21. Genesee River - 09	0.58	15.63	8.66	2.26	1.73	1.49	10.09	179.70		0.33	167562.37	3.56	11.59	1.31
22. Irondequoit Bay - 04	7.00	190.07	8.66	27.48	2.48	18.06	122.72	2185.33	64.74	3.98	2037707.59	43.34	140.90	15.90
23. Oswegatchie River - 05	9.49	257.78	8.66	37.26	3.36	24.50	166.44	2963.85		5.39	2763639.55	58.79	191.09	21.56
23. Oswegatchie River - 08	2.05	55.66	8.66	8.05	1.73	5.29	35.93	639.92		1.16	596694.90	12.69	41.26	4.66
23. Oswegatchie River - 10	4.77	129.51	8.66	18.72	1.73	12.31	83.62	1489.03		2.71	1388444.09	29.53	96.00	10.83
24. Raquette River - 05	60.12	1632.60	34.79	236.01	21.26	155.16	1054.09	18771.06		34.16	17503050.48	372.31	1210.26	136.57
24. Raquette River - 06	13.87	376.75	8.66	54.46	4.91	35.81	243.25	4331.78		7.88	4039165.49	85.92	279.29	31.52

Table A-4. (**continued**)

Project Location Reach - Month	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine
24. Raquette River - 07	69.37	1883.76	40.14	272.32	24.53	179.04	1216.26	21658.91		39.42	20195827.47	429.59	1396.45	157.58
24. Raquette River - 08	40.96	1112.41	23.70	160.81	14.49	105.72	718.23	12790.12		23.28	11926129.57	253.68	824.64	93.06

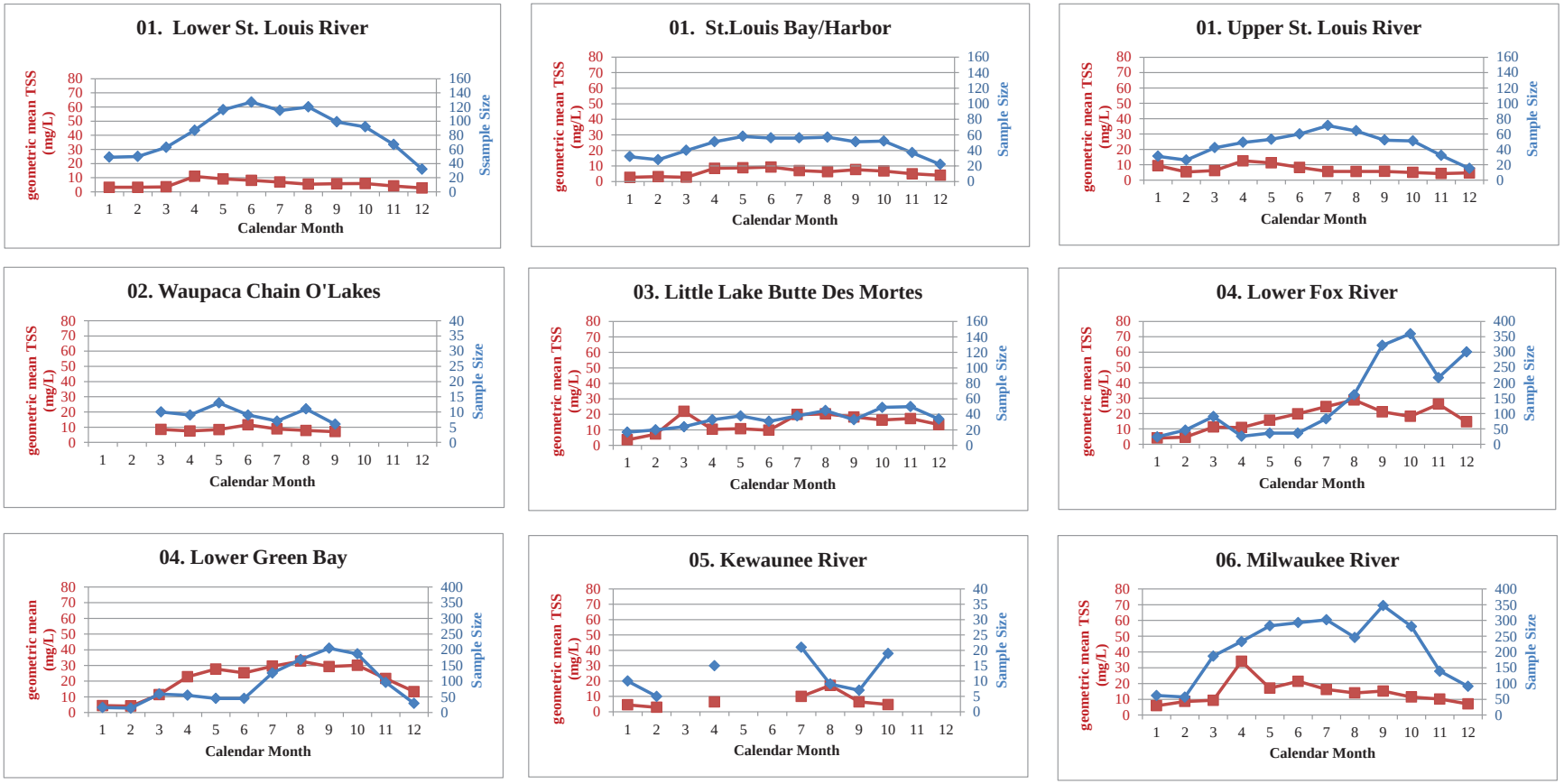


Figure A-1a. Geometric mean TSS (mg/L) (red squares) and corresponding sample sizes by calendar month (blue diamonds) based on historical USEPA STORET data collected in proximity to CEC sampling sites in the following project locations: St. Louis River/Bay, Waupaca Chain O'Lakes, Little Lake Butte Des Mortes, Fox River/Green Bay, Kewaunee River, and Milwaukee River. St. Louis River/Bay and Fox River/Green Bay project locations were subdivided for computing geometric mean TSS because of their large geographic extent and distinctly different types of waterbodies within the project locations.

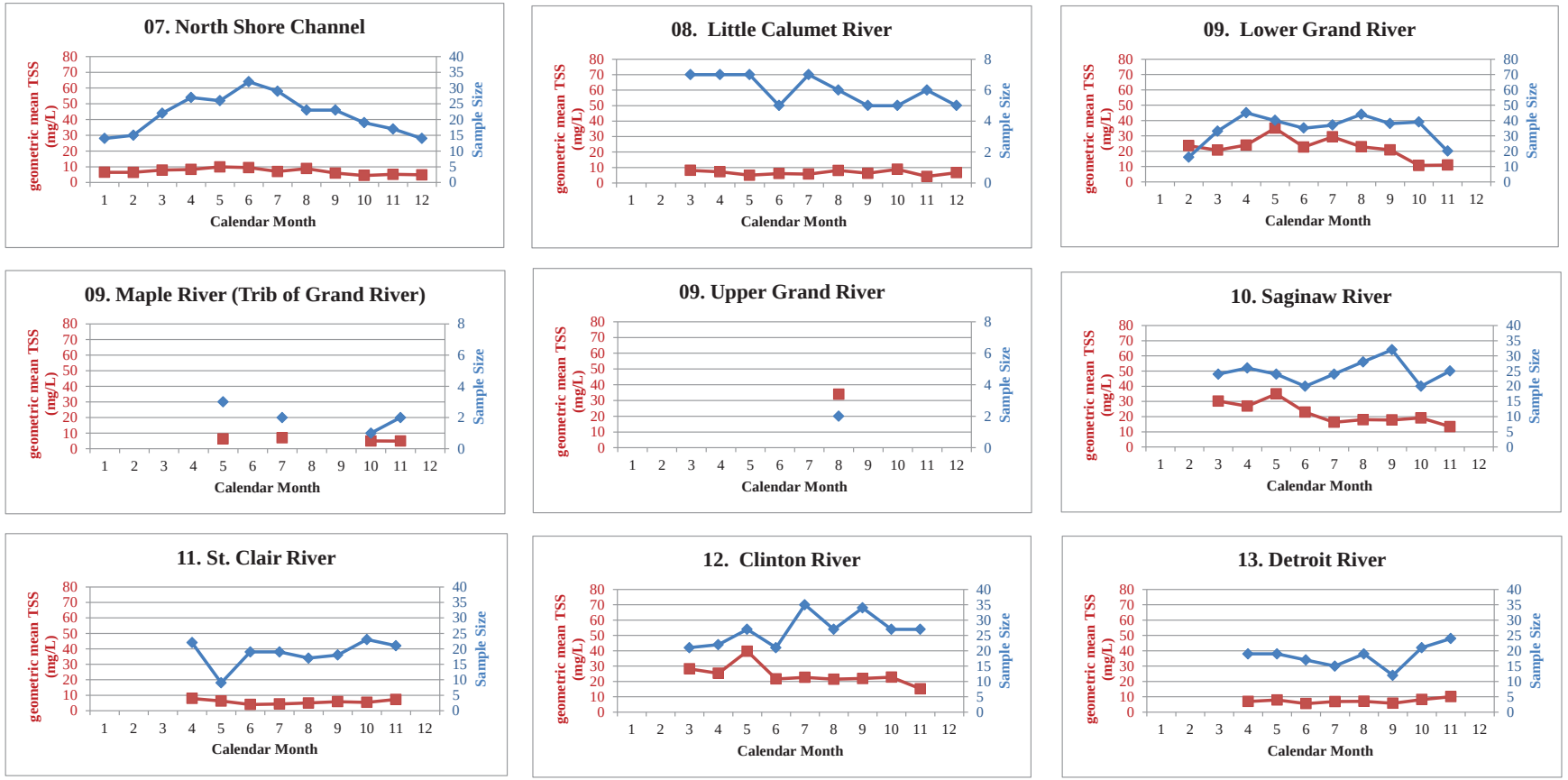


Figure A-1b. Geometric mean TSS (mg/L) (red squares) and corresponding sample sizes by calendar month (blue diamonds) based on historical USEPA STORET data collected in proximity to CEC sampling sites. Range of sample sizes for monthly geometric mean of TSS measurements in the following project locations: North Shore Channel, Little Calumet River, Grand/Maple River, Saginaw River, St. Clair River, Clinton River, and Detroit River. Sample size for geometric mean of historical TSS measurements by month ranged from 5 to 360 in these nine project locations. The Grand/Maple River project location was subdivided for computing geometric mean TSS because of its large geographic extent and distinctly different types of waterbodies within the project location.

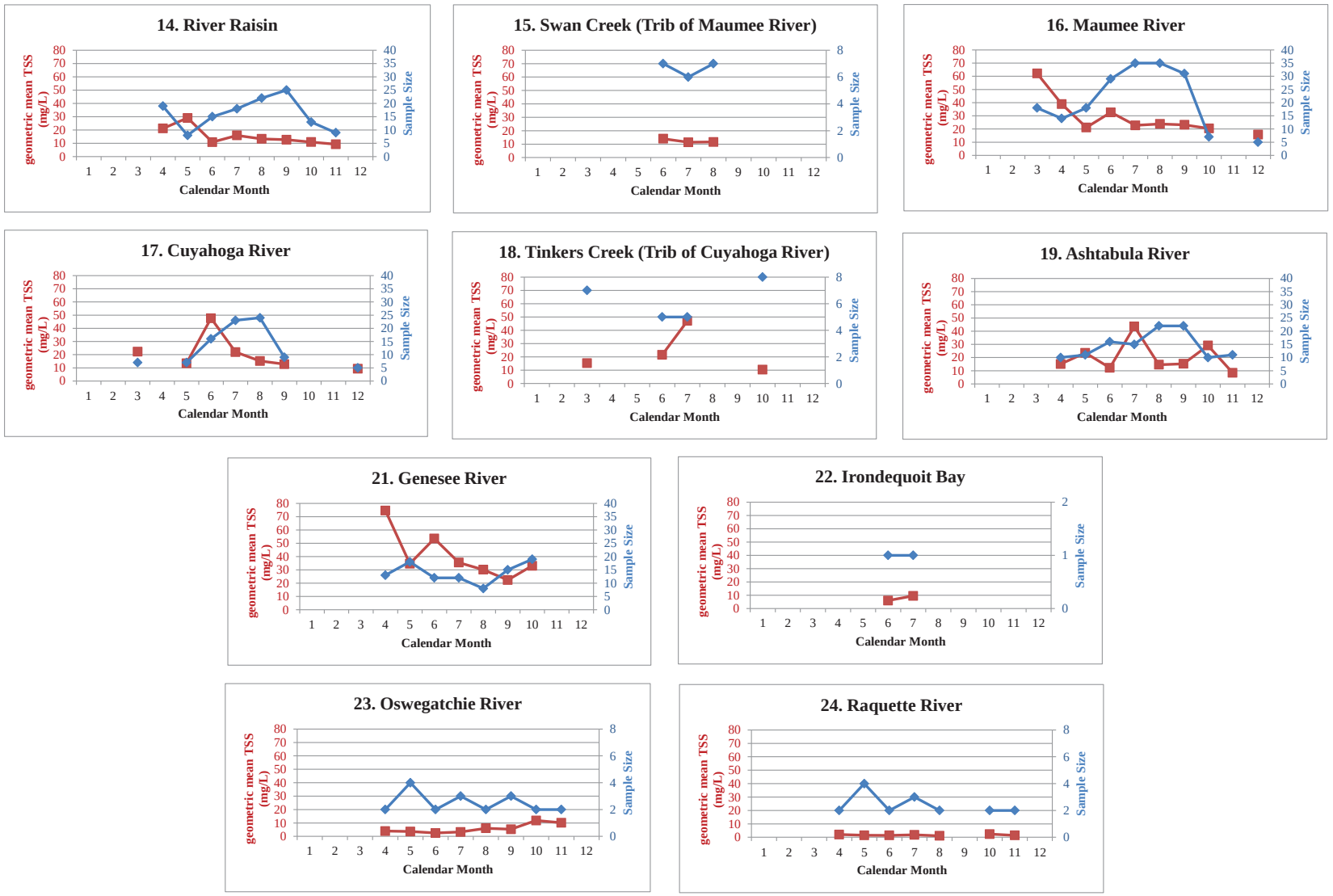


Figure A-1c. Geometric mean TSS (mg/L) (red squares) and corresponding sample sizes by calendar month (blue diamonds) based on historical USEPA STORET data collected in proximity to CEC sampling sites in the following project locations: River Raisin, Maumee River, Cuyahoga River, Ashtabula River, Genesee River, Irondequoit Bay, Oswegatchie River, and Raquette River. No STORET data were available for Long Pond; Long Pond TSS data were obtained from Makarewicz and Nowak (2010).

A2. Surface Water Sampling Information by Project Location

A2.1 St. Louis River/Bay

Political Units
State(s): Minnesota, Wisconsin
Municipalities: Duluth, MN and Superior, WI

Description
Sampled waterbodies at this project location include the upper St. Louis River, lower St. Louis River, and St. Louis Bay and Superior Bay. There were 32 sampling sites at this project location. All but the two upstream-most sampling sites fell within the St. Louis River Area of Concern (AOC), but only half of the sites were designated as potentially influenced by mapped CEC point sources. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017). Conversions of total CEC to aqueous CEC (Attachment A1) required empirical TSS data from the project location.

Due to large differences in geomorphology and water quality over its length, the project location was subdivided into 3 segments – upper river, lower river, and embayments – and CEC aqueous concentration was estimated separately based on TSS data from within each of those segments.

St. Louis River/Bay sampling sites evaluated for CEC hazards to fish.

St. Louis River/Bay Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source
Waterbody segment designations: Upper River (UR); Lower River (LR); Embayment (EM)

1. > BlatnikBr (2) - EM	9. **> HogIsland (5) - EM**	17. **> STB-MP-4 (1) – EM**	25. STR-FDL-2 (1) – LR
2. CloquetDW (2) - UR	10. MudLk (2) – LR	18. **> STB-MP-5 (1) - EM**	26. STR-FDL-3 (1) – LR
3. CloquetUP (2) - UR	11. NekukId (2) - LR	19. **> STB-MP-6 (1) - EM**	27. STR-FDL-4 (1) – LR
4. CloughId (2) - LR	12. **> RicesPt (8) – EM**	20. **> STB-WLSSD-1/ WLSSD-Far Dist (6) - EM**	28. STR-FDL-5 (1) – LR
5. > EriePr (8) - LR	13. **> SMTP (5–10) – EM**	21. **> STB-WLSSD-2 (1) – EM**	29. STR-FDL-6 (1) – LR
6. FDL (4) - LR	14. **> STB-MP-1 (1) – EM**	22. **> STB-WLSSD-3 (1) – EM**	30. TallasId (2) – LR
7. FondDu (2) - LR	15. **> STB-MP-2 (1) – EM**	23. **> STB-WLSSD-5 (1) - EM**	31. **> WLSSD-distal (19) - EM**
8. GrassyPt (6) - EM	16. **> STB-MP-3 (1) - EM**	24. STR-FDL-1 (1) - LR	32. WireMi (2) - LR

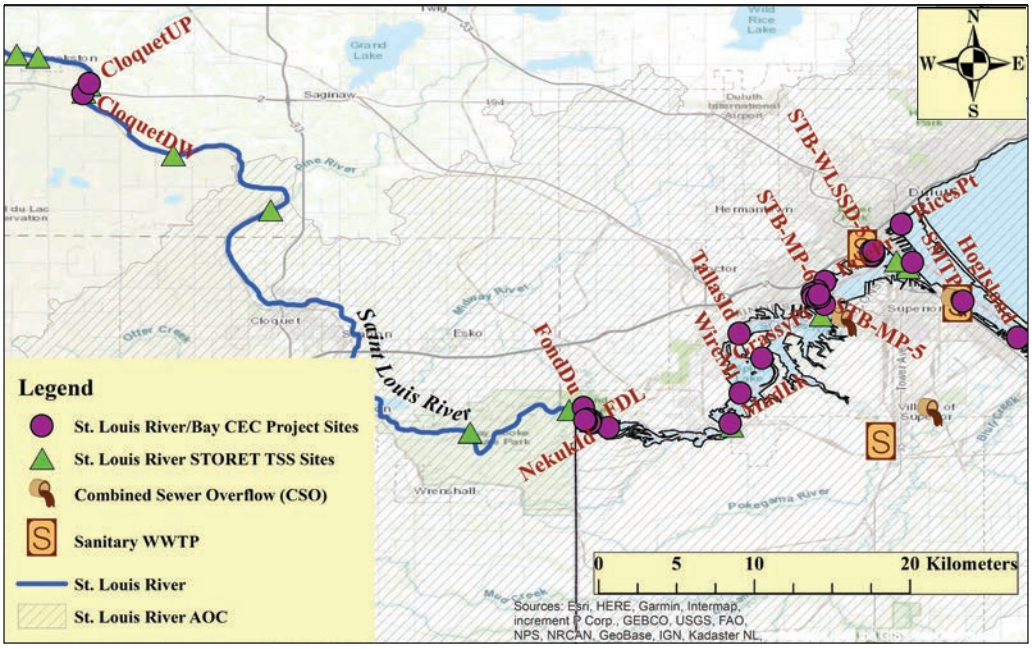


Figure A2-1a. St. Louis River/Bay Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations were adjusted to estimated aqueous concentrations using historical water quality data reported in the USEPA STORET database.

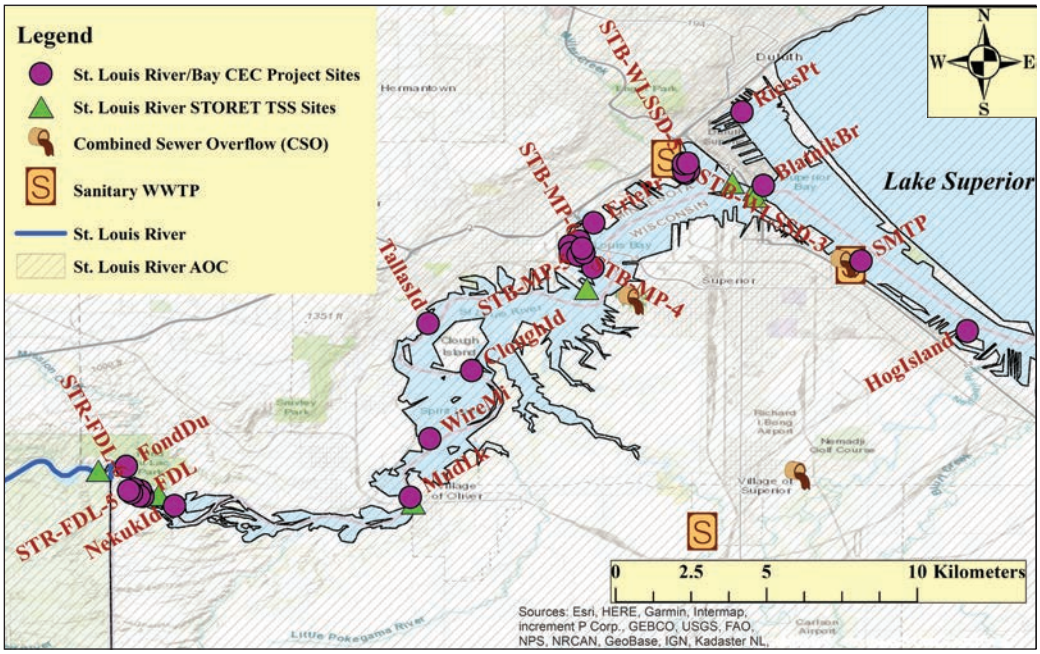


Figure A2-1b. Lower River, St. Louis Bay and Superior Bay Sampling Station Map.

Political Units
State(s): Wisconsin
Municipalities: There are no major municipalities within this project location. The nearest mapped CEC point source is at Waupaca, WI, downstream of the sampling sites.

Description
Surface water was sampled in Rainbow Lake of the Waupaca Chain O' Lakes, near the headwaters of Crystal River. The Crystal River is a tributary of Waupaca River, which in turn is a tributary of the Fox River. The Fox River discharges into Green Bay, Lake Michigan. Neither of the two sampling sites at this project location (COL1 and COL2) falls within an Area of Concern. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017). A total of two surface water samples was collected at each site.

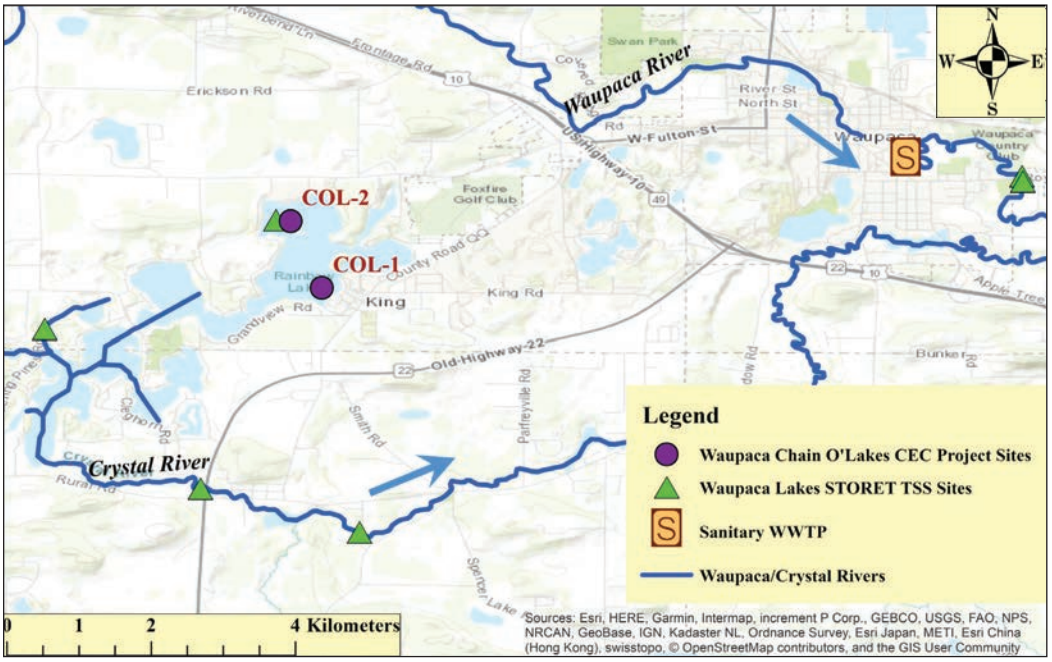


Figure A2-2. Waupaca Chain O'Lakes Sampling Station Map. Surface water CEC concentrations were determined at the CEC project sites located in headwater lakes of the Crystal River watershed, Wisconsin. Measured total CEC concentrations of certain CECs were adjusted to aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.3 Little Lake Butte des Morts

Political Units
State(s): Wisconsin
Municipalities: Developed areas with a CEC point source that discharges into the Little Lake Butte Des Mortes project area include Neena and Menasha, WI.

Description
Little Lake Butte des Morts is just downstream of Lake Winnebago in the Fox River drainage. Both lakes are embedded in the Fox River, but are well upstream of the Area of Concern.

Little Lake Butte des Morts sampling sites evaluated for CEC hazards to fish.

Little Lake Butte des Morts Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. LLB-1 (4)
2. **> LLB-2 (8)**
3. **> LLB-3 (8)**
4. **> LLB-4 (4)**
5. **> LLB-5 (4)**

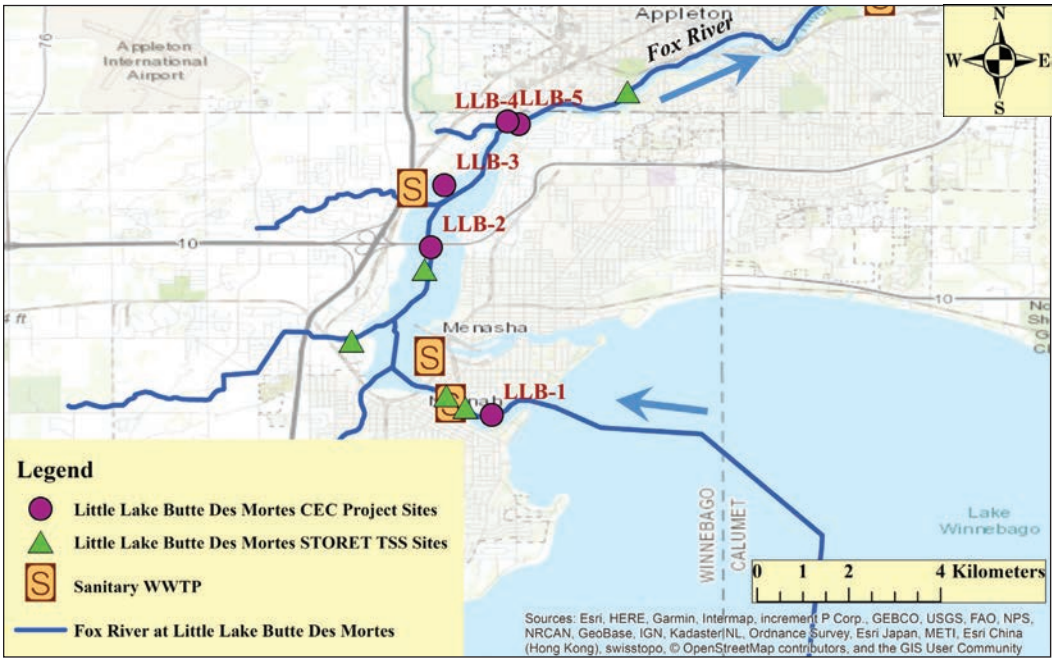


Figure A2-3. Little Lake Butte des Morts Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations of certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate flow direction.

Political Units

State(s): Wisconsin

Municipalities: Developed areas with a CEC point source that discharges into the project location include the municipalities of Appleton, Kaukauna, Wrightstown, De Pere, and Green Bay, WI.

Description

The Fox River flows eastward approximately 320 km (200 mi) across Wisconsin, discharging into Green Bay of Lake Michigan at Green Bay, WI. The watershed includes a number of embedded inland lake systems, including Lake Winnebago, Lake Butte des Morts, Little Lake Butte des Morts, and Waupaca Chain O'Lakes. This project location spans approximately 102 km (63 mi) reach of the lower river and Green Bay, including a couple of reference sites upstream of Lake Winnebago (not shown in map); all sites were included in the EHA. Sampling sites in the lowermost ~12 km (7.5 mi) of lower river and in Green Bay fall within the Fox River AOC. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017). Conversions of total CEC to aqueous CEC (Attachment A1) required empirical TSS data from the project location. Due to large differences in geomorphology and water quality over its length, the project location was subdivided into two segments – upper river, and lower river/Green Bay- and CEC aqueous concentration was estimated separately based on TSS data located within each segment.

Fox River/Green Bay sampling sites evaluated for CEC hazards to fish

Fox River/Green Bay Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source
Waterbody segment designations: Upper River (UR); Lower River and Green Bay (LRB)

1. > DPERE-9 (3) - UR
2. EASTR-10 (3) - UR
3. > FXR-1 (1) - LRB
4. > FXR-13 (4) - UR
5. > FXR-14 (1) - UR
6. > FXR-2 (1) - LRB
7. > FXR-3 (1) - LRB
8. FXR-4 (1) - LRB
9. FXR-5 (2) - LRB
10. FXR-6 (1) - LRB
11. > GRBAY-12 (3) - UR
12. LBM-1 (3) - UR
13. LKP-1 (3) - UR
14. > LLB-6 (8) - UR
15. PRGAM-11 (2) - UR

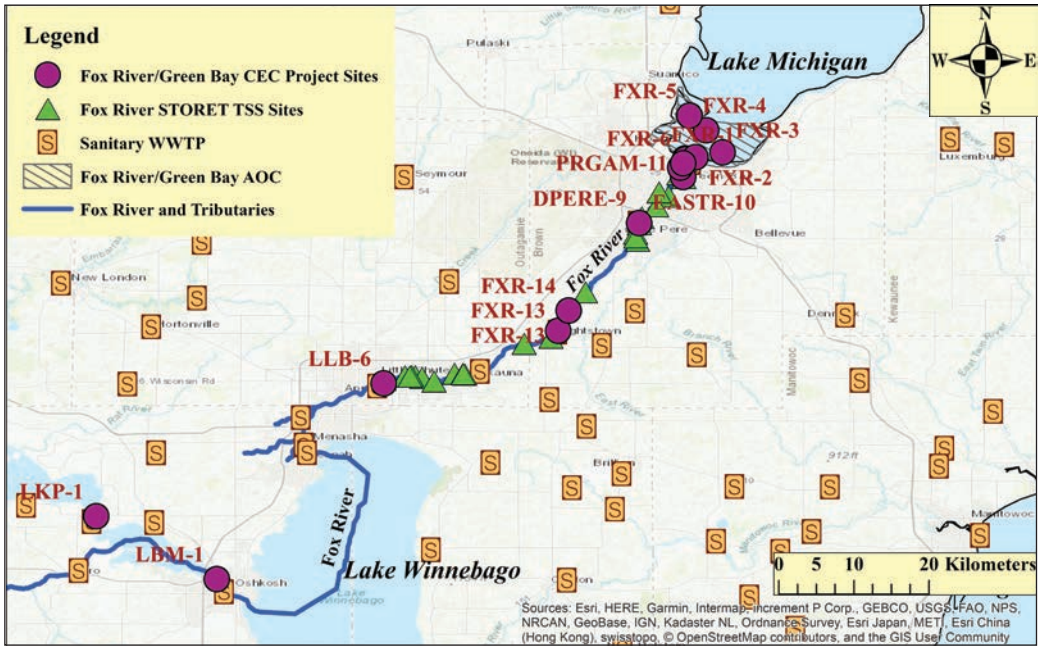


Figure A2-4a. Fox River/Green Bay Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

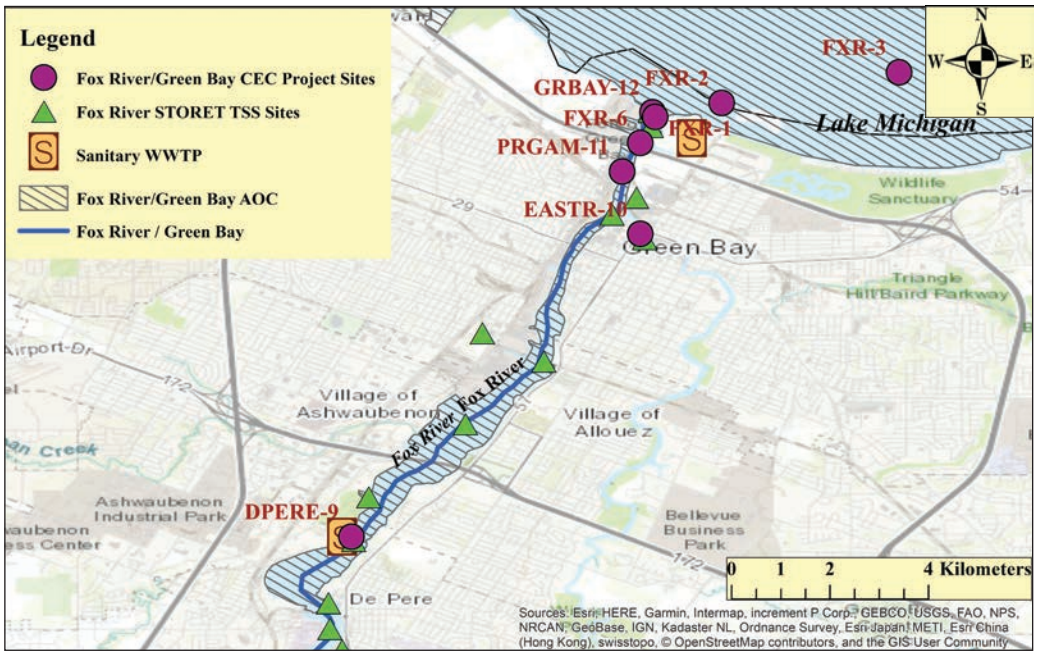


Figure A2-4b. Fox River mouth at Green Bay, Lake Michigan - Sampling Station Map.

Political Units
State(s): Wisconsin
Municipalities: Developed areas with CEC point sources that discharge into this project location include Luxemburg, Casco, and Kewaunee, WI.

Description
Samples were collected from the main stem of the Kewaunee River on the Kewaunee Peninsula, which empties into Lake Michigan. Casco Creek, a tributary of Kewaunee River, has a mapped WWTP that contributes CEC loading to the river. No sampling sites are within an Area of Concern.

Kewaunee River sampling sites evaluated for CEC hazards to fish.

Kewaunee River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. KWE-1 (3)
2. **> KWE-2 (3)**
3. **> KWE-3 (5)**
4. KWE-4 (3)
5. **> KWE-5 (5)**

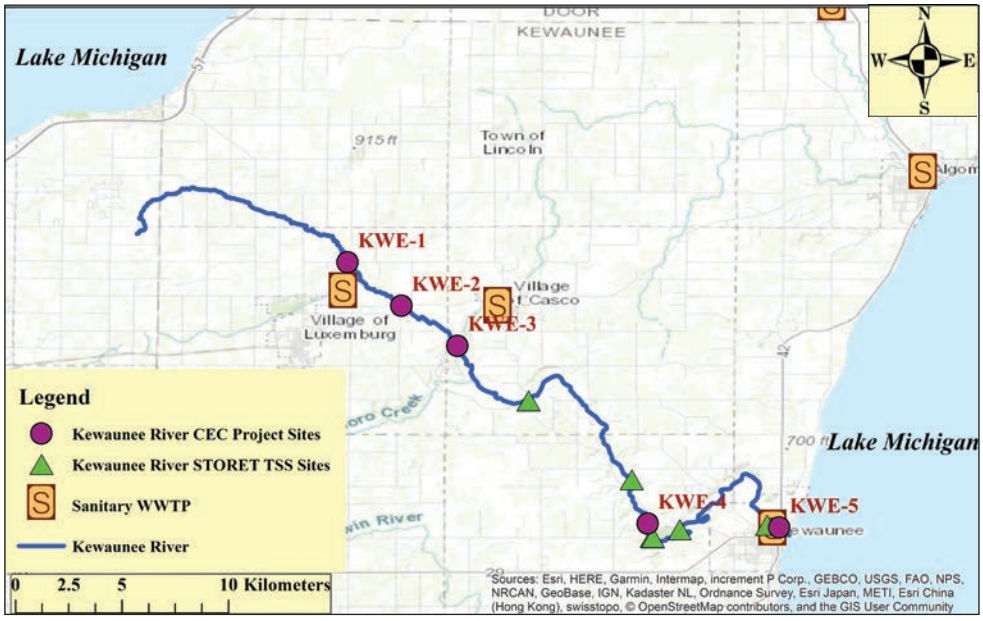


Figure A2-5. Kewaunee River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.6 Milwaukee River

Political Units
State(s): Wisconsin
Municipalities: Milwaukee, WI

Description
Sampled waterbodies in this urban project location include the lower reaches and confluence of the Menomonee, Kinnikinnic, and Milwaukee Rivers, and Lake Michigan immediately adjacent to the mouth of the watershed. All four sampling sites fall within the Milwaukee River AOC, and all four are potentially influenced by CEC point sources. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Milwaukee River sampling sites evaluated for CEC hazards to fish.

Milwaukee River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** **Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source**
1. > JISLA-15 (2)
2. > KINI-17 (2)
3. > MENMR-13 (2)
4. **> MILWR-14 (2)**

Figure A2-6. Milwaukee River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on water quality data from historical data reported in the USEPA STORET database.

A2.7 North Shore Channel

Political Units
State(s): Illinois
Municipality: Chicago, IL

Description
The North Shore Channel is a 12 km (7.5 mi) sanitary and shipping channel that flows from Lake Michigan to the Chicago River. Although it is not within an Area of Concern, it receives effluent from a major WWTP and numerous CSOs.

North Shore Channel sampling sites evaluated for CEC hazards to fish.

North Shore Channel Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. **> CHI-112 (3)**
2. **> CHI-36 (3)**
3. **> CHI-RP4 (6)**

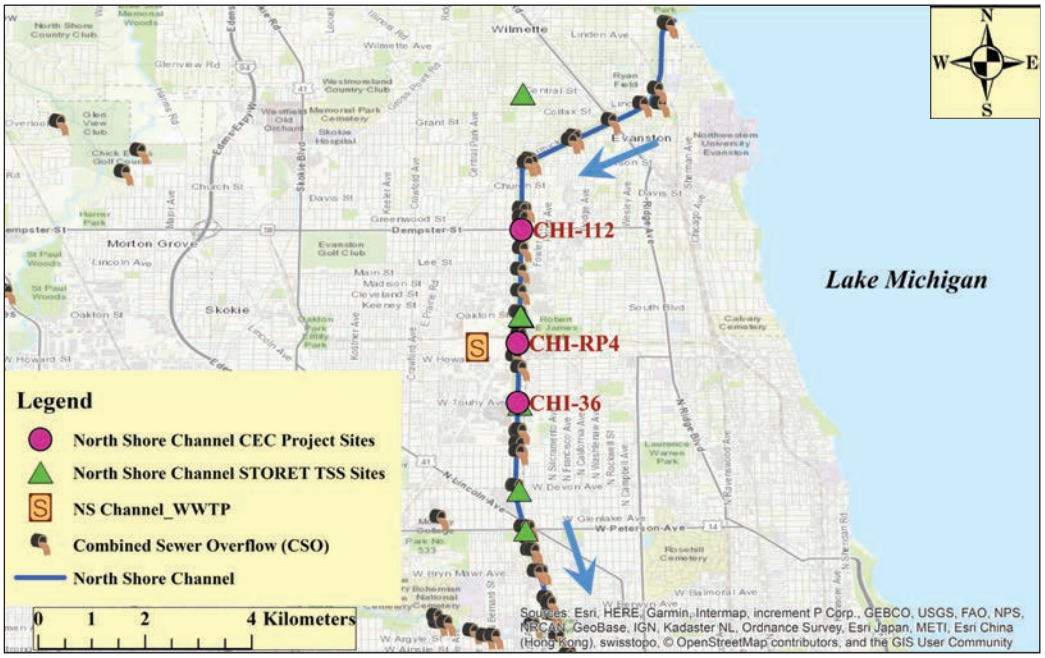


Figure A2-7. North Shore Channel Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimate aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate direction of flow.

A2.8 Little Calumet River

Political Units
State(s): Illinois
Municipality: Chicago, IL

Description
The reach of the Little Calumet River containing the project location flows bi-directionally, either toward Lake Michigan or toward the Calumet-Saganashkee Channel, depending on water level in Lake Michigan. The project location is not located within an Area of Concern, but receives inputs from numerous CEC point sources.

Little Calumet River sampling sites evaluated for CEC hazards to fish.

Little Calumet River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** **Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source**
1. > CHI-56 (3) **2. > CHI-76 (3)** **3. > CHI-RP7 (6)**

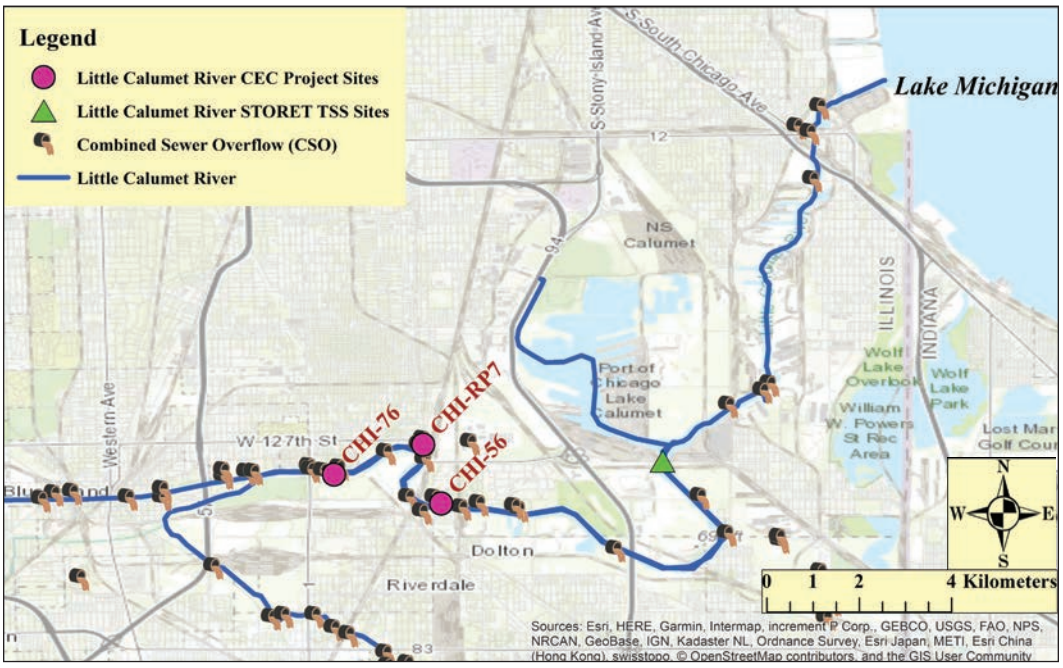


Figure A2-8. Little Calumet River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrow indicates bidirectional flow.

A2.9 Grand River / Maple River

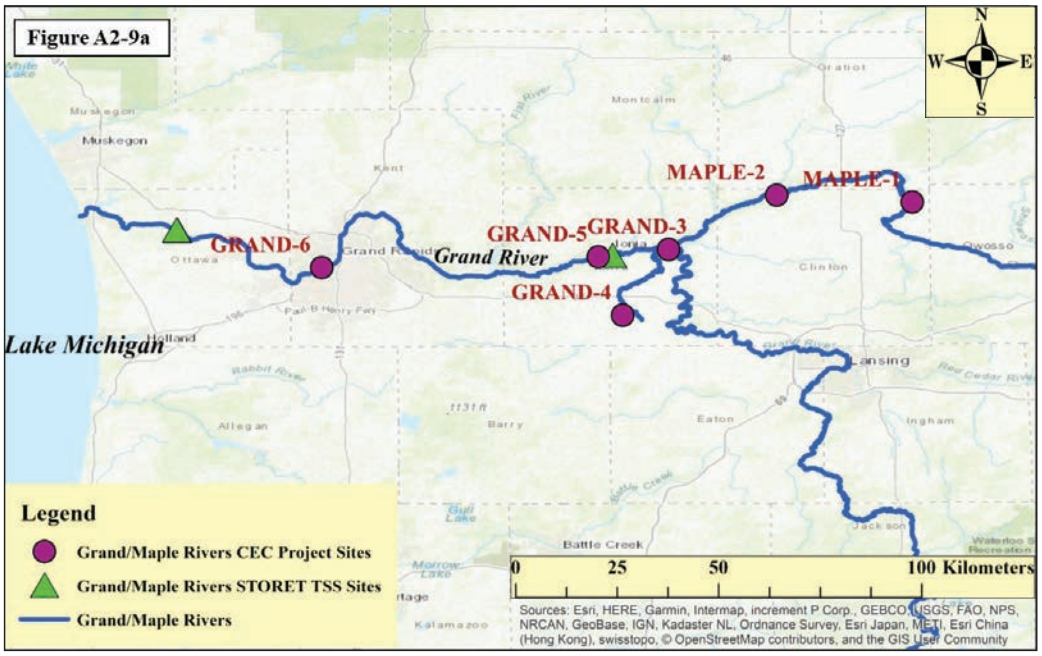
Political Units
State(s): Michigan
Municipalities: Comstock Park, Grand Rapids, Grandville, Jenison, Allendale

Description
The Grand River flows westward, traversing several hundred kilometers across the lower peninsula of Michigan. The river and tributaries receive CEC inputs from multiple WWTPs throughout the watershed including Comstock Park, Grand Rapids, Grandville, Jenison, Allendale and other municipalities on the main stem, and discharging into Lake Michigan at Grand Haven. The Maple River is a major tributary of the Grand River that receives effluent from significantly fewer mapped CEC point sources. None of the sampling sites is within an Area of Concern, but two are potentially influenced by mapped CEC point sources (Figures A2-9b through 9d). Conversions of total CEC to aqueous CEC (Attachment A1) required empirical TSS data from the project location. Due to potential differences in geomorphology and water quality over the watershed, this project location was subdivided into three segments – upper Grand River, and lower Grand River, and Maple River - and CEC aqueous concentration was estimated separately based on TSS data located within each segment.

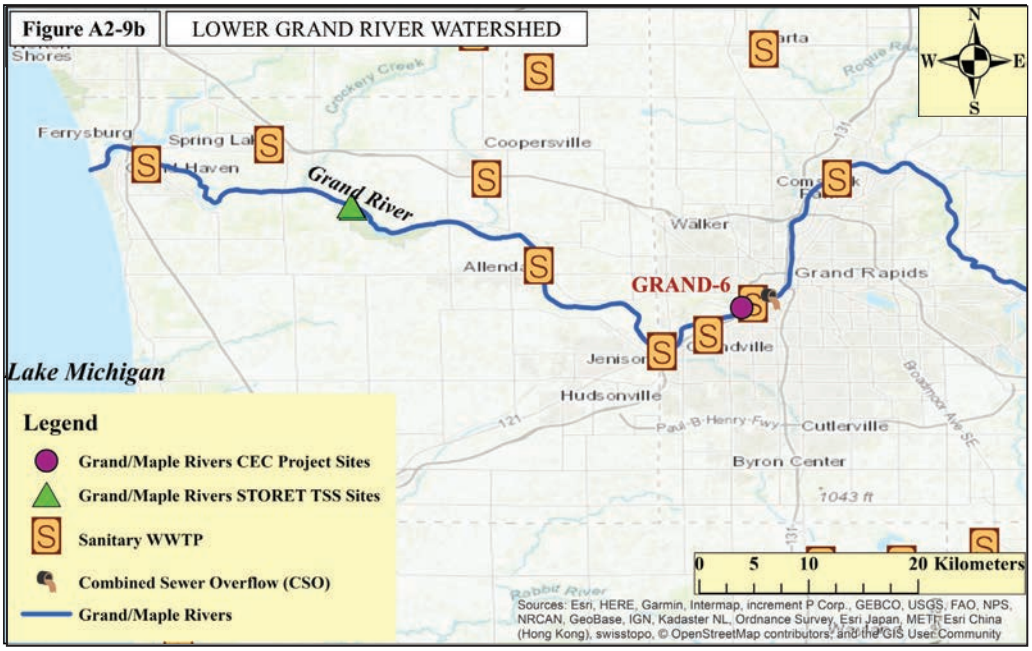
Grand River/Maple River sampling sites evaluated for CEC hazards to fish.

Grand River / Maple River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source
Waterbody segment designations: Upper Grand River (UGR); Lower Grand River (LGR); Maple River (MR)

1. GRAND-3 (3) - UGR
2. GRAND-4 (2) - UGR
3. GRAND-5 (3) - LGR
4. **> GRAND-6 (3) - LGR**
5. MAPLE-1 (3) - MR
6. **> MAPLE-2 (3) - MR**



Figures A2-9 (a to d). Grand River/Maple River Sampling Station Map. Surface water CEC concentrations were determined at the CEC project sites. Measured unfiltered CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate direction of flow.



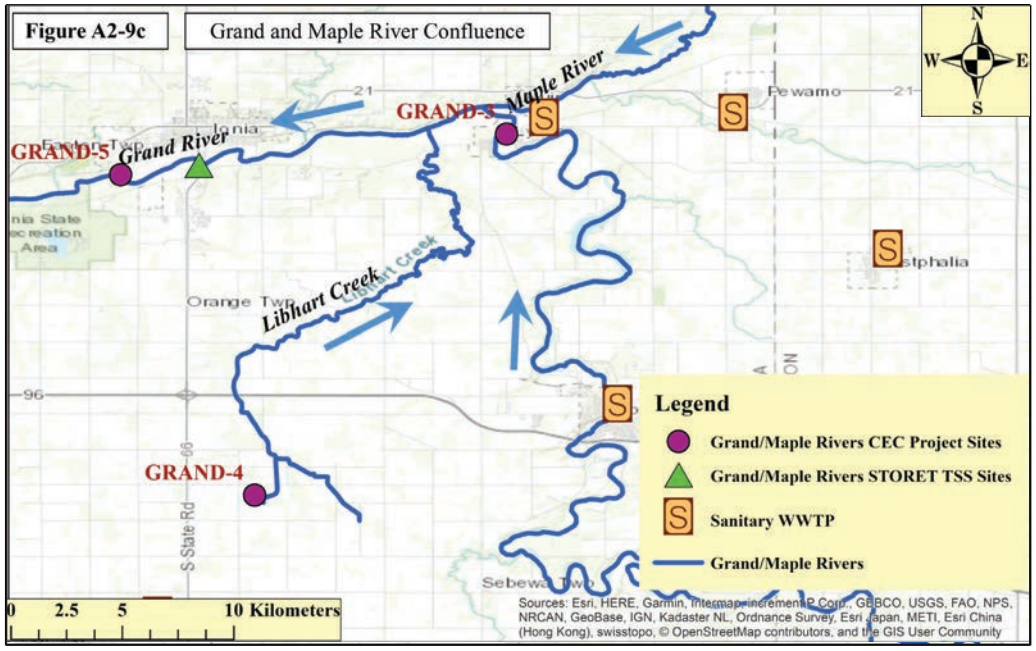


Figure A2-9c
Grand and Maple River Confluence
GRAND-5
Grand River
GRAND-3
Maple River
GRAND-4
Libhart Creek
Orange Twp
Pewamo
Ionia
Legend
Grand/Maple Rivers CEC Project Sites
Grand/Maple Rivers STORET TSS Sites
Sanitary WWTP
Grand/Maple Rivers
0 2.5 5 10 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

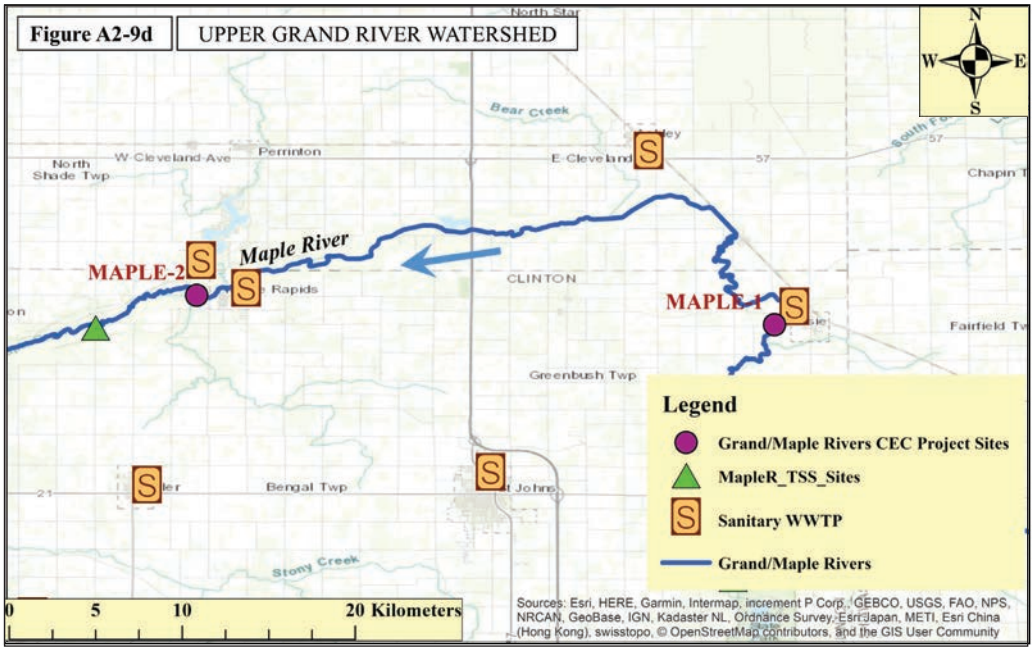


Figure A2-9d
UPPER GRAND RIVER WATERSHED
MAPLE-2
Maple River
MAPLE-1
Bear Creek
North Shade Twp
W Cleveland Ave
Perrinton
E Cleveland
CLINTON
Greenbush Twp
Bengal Twp
Stony Creek
Legend
Grand/Maple Rivers CEC Project Sites
MapleR_TSS_Sites
Sanitary WWTP
Grand/Maple Rivers
0 5 10 20 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

A2.10 Saginaw River

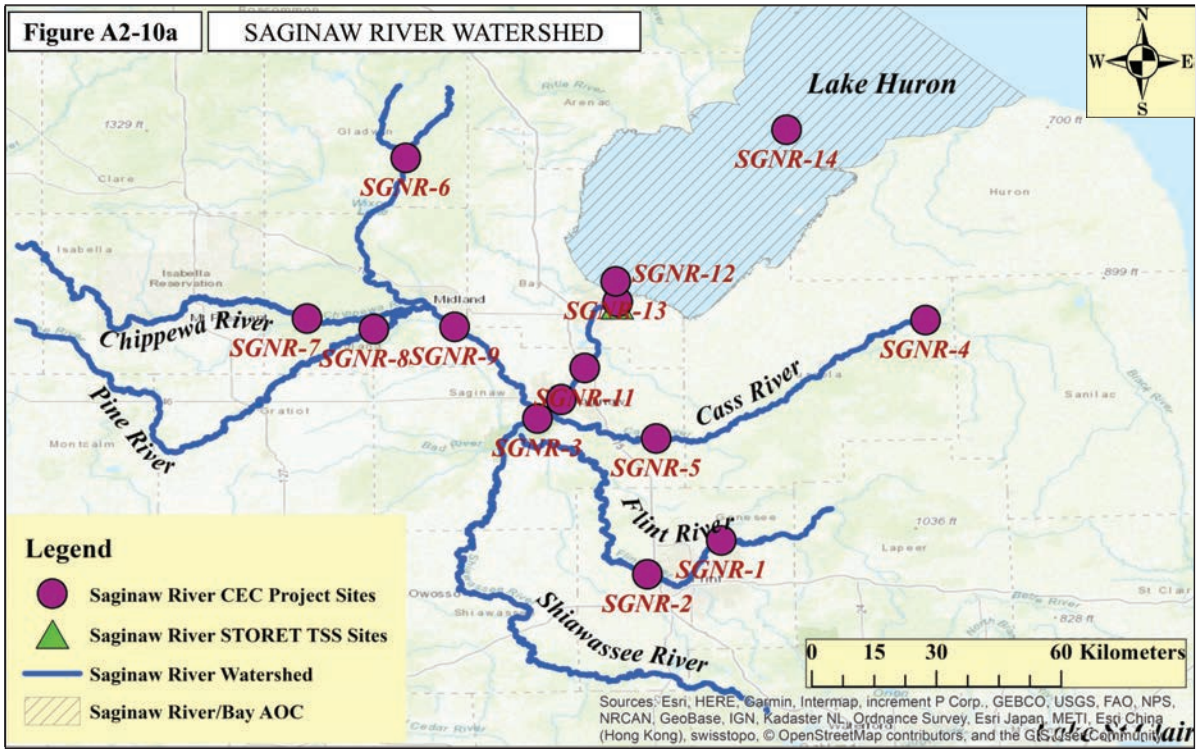
Political Units
State(s): Michigan
Municipalities: Essexville, Bay City, Saginaw, Bridgeport, Frankenmuth, Flushing, Midland, Beecher, Flint, Owosso

Description
The Saginaw River project location is comprised of a network of tributary rivers that converge to form the Saginaw River, which discharges into Saginaw Bay of Lake Huron at Saginaw, MI. The Saginaw River system drains a 22,260 km^2 (8,595 mi^2) watershed in central Michigan. The entire 35 km (22 mi) main stem of the Saginaw River below the confluence of three feeder rivers, as well as Saginaw Bay, comprise the Saginaw River Area of Concern. The watershed receives CEC input from dozens of point sources distributed throughout the river system (Figures A2-10b to 10e). Sampling sites within this project location are located both within the AOC in the lower river and in upstream tributary rivers including the Molasses, Titabawassee, Chippewa, Pine, Shiawassee, Flint, and Cass Rivers.

Saginaw River sampling sites evaluated for CEC hazards to fish.

Saginaw River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. SGNR-1 (2)	**4. > SGNR-12 (2)**	**7. > SGNR-2 (2)**	**10. > SGNR-5 (2)**	13. SGNR-8 (2)
2. > SGNR-10 (2)	5. SGNR-13 (2)	8. SGNR-3 (2)	11. SGNR-6 (2)	**14. > SGNR-9 (2)**
3. > SGNR-11 (2)	6. SGNR-14 (2)	9. SGNR-4 (2)	12. SGNR-7 (2)	



Figures A2-10 (a to e). Saginaw River Watershed Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured unfiltered CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on water quality data from historical data reported in the USEPA STORET database. Arrows indicate direction of flow.

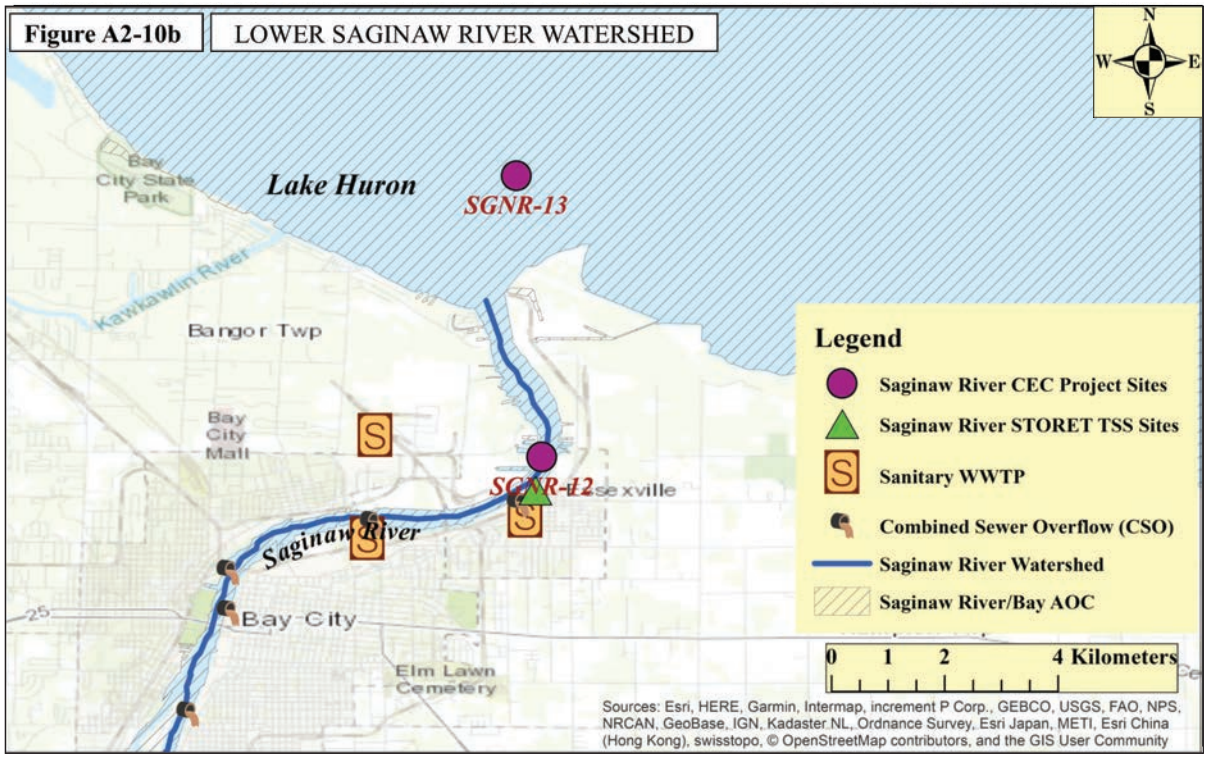



Figure A2-10c
CENTRAL SAGINAW RIVER WATERSHED
N
W
E
S
Saginaw River
SGNR-11
Cheboyganing Creek
Saginaw Twp
Carrollton Twp
Saginaw
Buena Vista
SGNR-10
Tittabawassee River
James Twp
SGNR-3
Shiawassee River
Cass River
Spaulding Twp
Legend
Saginaw River CEC Project Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Saginaw River Watershed
Saginaw River/Bay AOC
0 1.5 3 6 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

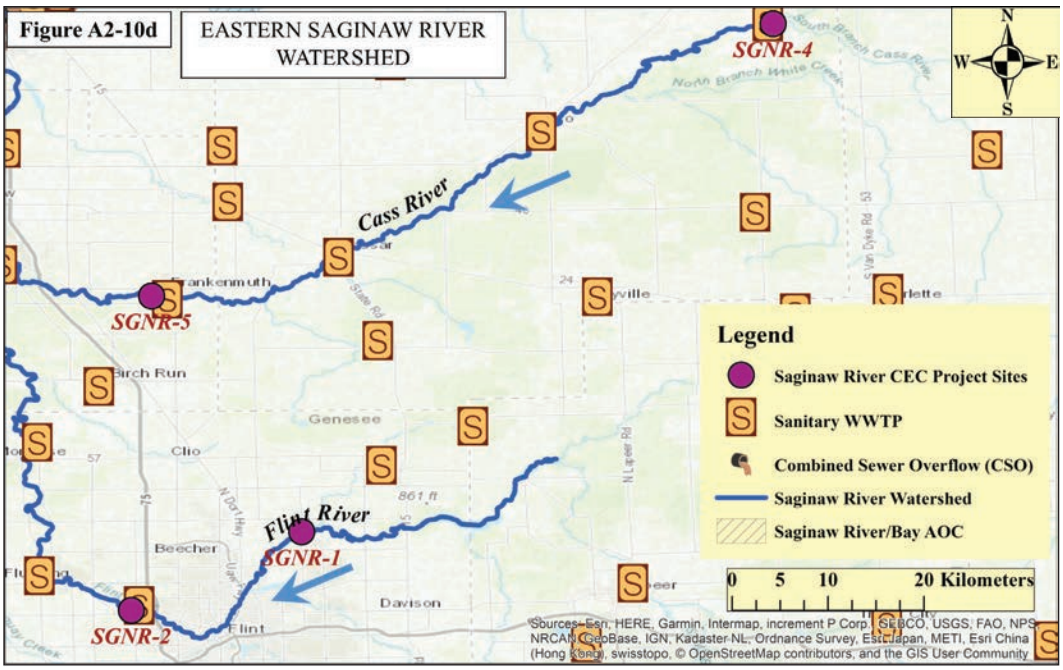
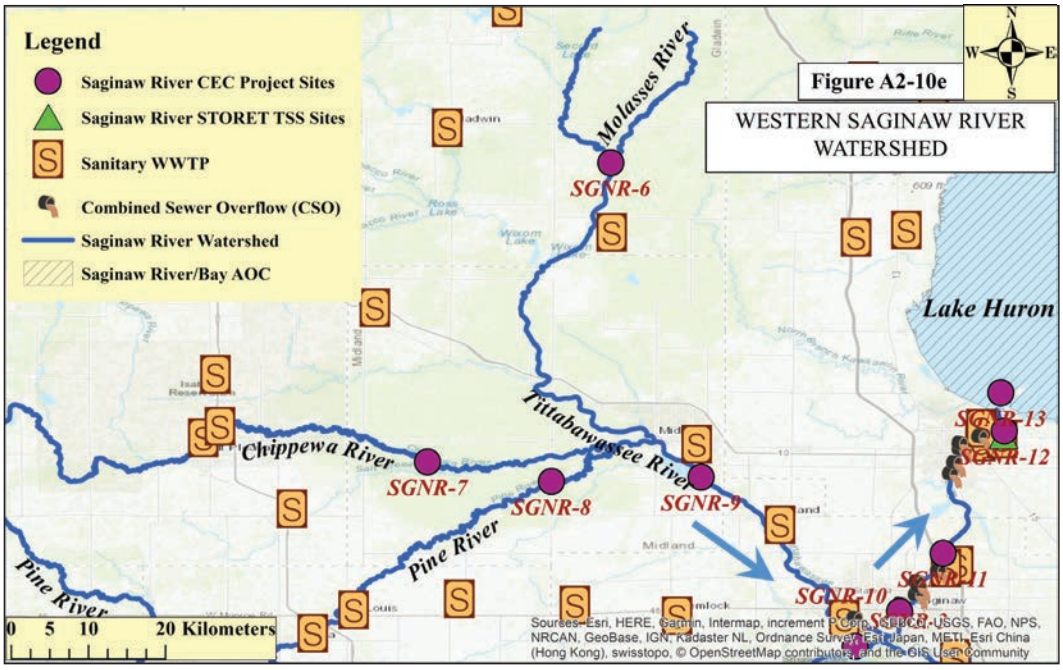


Figure A2-10d
EASTERN SAGINAW RIVER WATERSHED
N
W
E
S
SGNR-4
Cass River
Frankenmuth
SGNR-5
Birch Run
Genesee
Clio
Flint River
SGNR-1
Beecher
Davison
SGNR-2
Flint
Legend
Saginaw River CEC Project Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Saginaw River Watershed
Saginaw River/Bay AOC
0 5 10 20 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community


Legend
Saginaw River CEC Project Sites
Saginaw River STORET TSS Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Saginaw River Watershed
Saginaw River/Bay AOC
Figure A2-10e
WESTERN SAGINAW RIVER WATERSHED
N
W
E
S
Molasses River
SGNR-6
Lake Huron
SGNR-13
SGNR-12
Tittabawassee River
Chippewa River
SGNR-7
SGNR-8
SGNR-9
SGNR-10
SGNR-11
Pine River
Pine River
0 5 10 20 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

A2.11 St. Clair River

Political Units
State(s): Michigan
Municipalities: Port Huron, Marysville, St. Clair, Marine City

Description
The St. Clair River flows 65 km (40.5 mi) south from Lake Huron to Lake St. Clair, serving as the boundary between the U.S. to the west of the river and Canada to the east. The entire river is an Area of Concern, and receives CEC inputs from numerous point sources on both sides of the international border.

St. Clair River sampling sites evaluated for CEC hazards to fish.

St. Clair River Project Location – Surface Water Sampling Sites (N) = Total Number of sampling events per site Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source			
1. > SCR-1 (2)	**3. > SCR-3 (2)**	**5. > SCR-5 (2)**	7. SCR-7 (1)
2. > SCR-2 (1)	**4. > SCR-4 (1)**	6. SCR-6 (1)	8. SCR-8 (1)

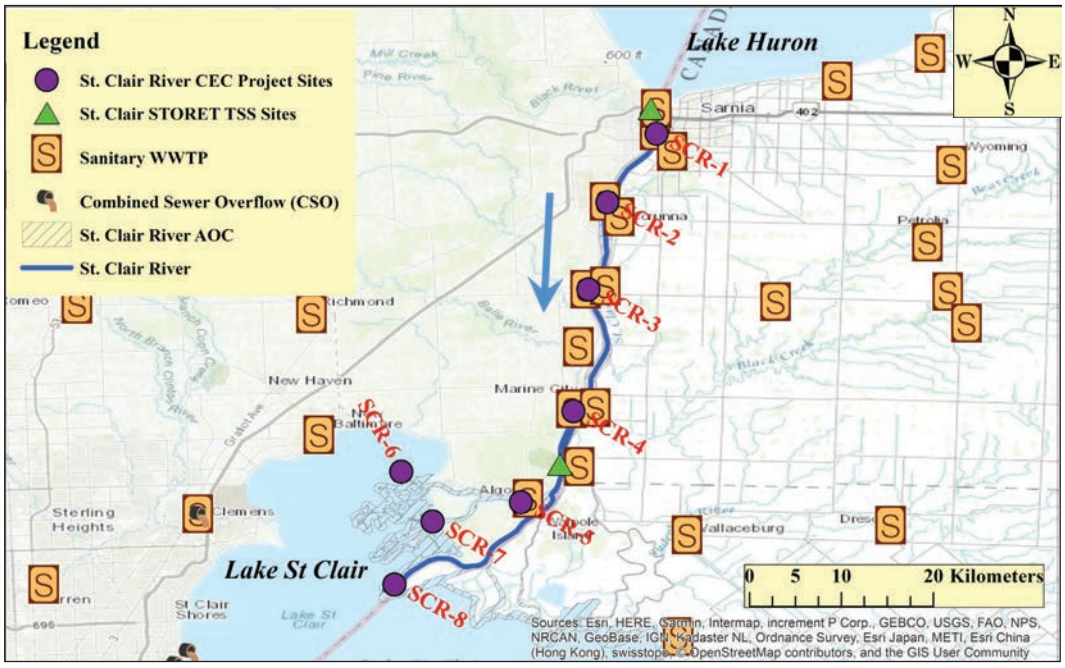


Figure A2-11. St. Clair River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrow indicates direction of flow.

A2.12 Clinton River

Political Units
State(s): Michigan
Municipalities: Sterling Heights, Pontaic

Description
The Clinton River flows east approximately 134 km (83 mi) draining a 2,000 km² (760 mi²) watershed in the lower peninsula of Michigan into Lake St. Clair. The project location is in the lower river, receiving CEC inputs from several point sources. All of the CEC sampling sites fall within the Clinton River Area of Concern.

Clinton River sampling sites evaluated for CEC hazards to fish.

Clinton River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** **Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source**		
1. > CLI-1-DOWN (2)	**3. > CLI-3-WWTP (2)**	5. CLI-5-CASS (2)
2. CLI-2-CAPT (2)	4. CLI-4-STONY (2)	

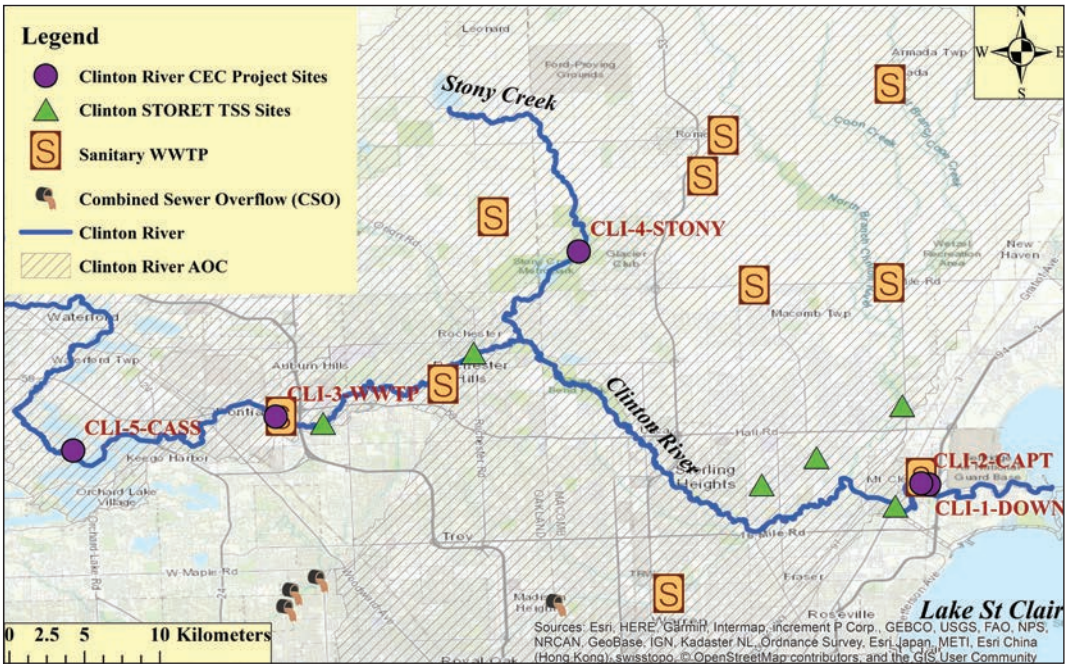


Figure A2-12. Clinton River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

Political Units
State(s): Michigan
Municipalities: Belle Isle, Detroit, Dearborn, Trenton

Description
The Detroit River flows 45 km (28 mi) south from Lake St. Clair to the northwest end of Lake Erie, serving as the boundary between the U.S. to the west of the river and Canada to the east. The entire river is an AOC. Numerous CSOs and several WWTPs discharge into the river from greater metropolitan Detroit at the north end of the river. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Detroit River sampling sites evaluated for CEC hazards to fish.

Detroit River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** **Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source**			
1. > DTR-1 (2)	**4. > DTR-4 (1)**	**7. > GROSIL-3 (2)**	10. WYAND-2 (2)
2. > DTR-2 (2)	5. DTR-5 (1)	8. PTHENN-1 (2)	
3. DTR-3 (2)	6. DTR-6 (1)	**9. > TRENTN-4 (2)**	

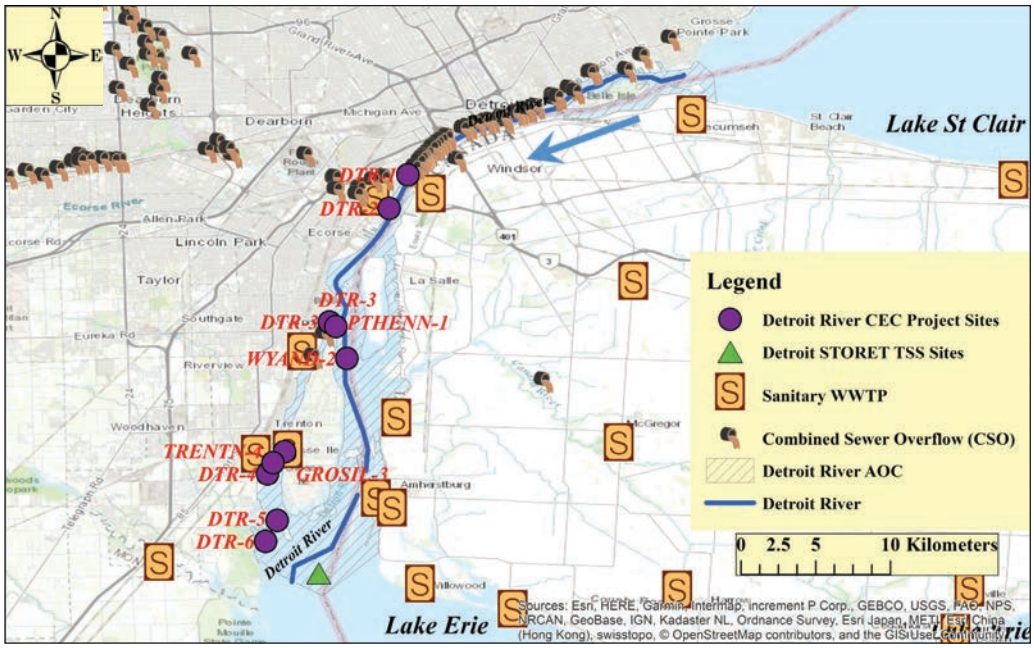


Figure A2-13. Detroit River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrow indicates direction of flow.

Political Units
State(s): Michigan
Municipality: Monroe

Description
The River Raisin flows about 220 km (140 mi) eastward from south central Michigan and enters Lake Erie on the western shore, draining a watershed of 2,780 km^2 (1,070 mi^2). A major WWTP discharges into the river just upstream of the Port of Monroe near the river mouth. Sampling sites are located both within and upstream of the River Raisin Area of Concern, which is located in and around the Port. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).7).

River Raisin sampling sites evaluated for CEC hazards to fish.

River Raisin Project Location – Surface Water Sampling Sites (N) = Total Number of sampling events per site Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source
1. RRR-1 (1)
2. RRR-2 (1)
3. > RRR-3 (1)
4. > RRR-4 (1)

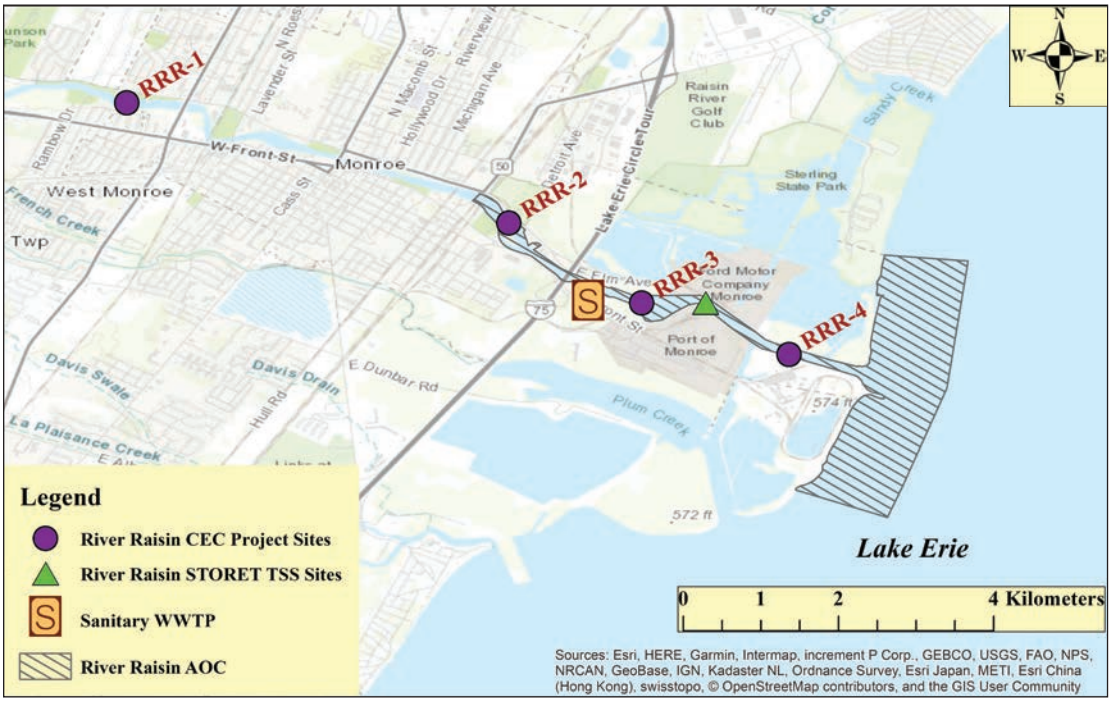


Figure A2-14. River Raisin Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.15 Swan Creek

Political Units
State(s): Ohio
Municipality: greater Toledo

Description
Swan Creek is a tributary of the Maumee River with a watershed of 530 km² (204 mi²). The creek-river confluence is located within the city of Toledo, OH. The creek receives CEC inputs from numerous point sources near the creek mouth. All Swan Creek CEC sampling sites fall within the Maumee River Area of Concern, but upstream of the WWTP. Additional characteristics of this location and associations between CEC concentrations and watershed land cover are described in Choy et al. (2017).

Swan Creek sampling sites evaluated for CEC hazards to fish.

Swan Creek Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. **> SWC-01 (1)**
2. **> SWC-02 (1)**
3. **> SWC-03 (1)**
4. **> SWC-04 (1)**
5. **> SWC-05 (1)**
6. **> SWC-06 (1)**
7. **> SWC-07 (2)**
8. **> SWC-08 (2)**
9. **> SWC-09 (3)**
10. **> SWC-10 (2)**
11. **> SWC-11 (2)**
12. **> SWC-12 (1)**
13. **> SWC-CP-8 (1)**

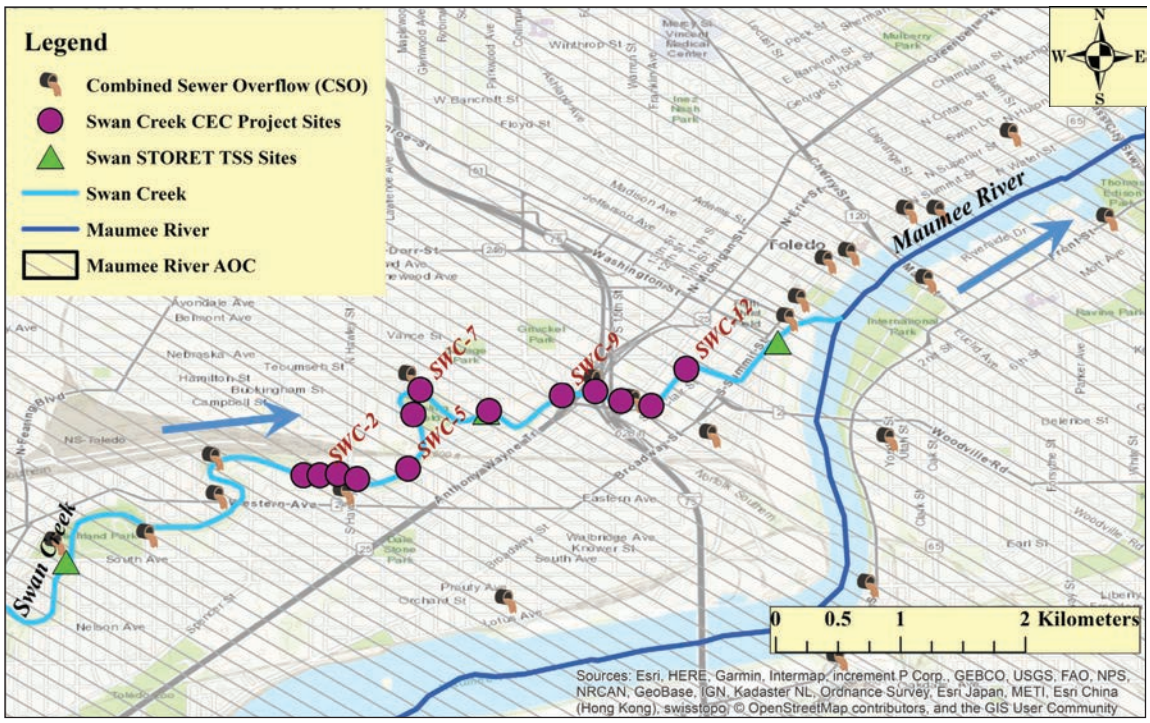


Figure A2-15. Swan Creek Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrow indicates direction of flow.

A2.16 Maumee River

Political Units
State(s): Ohio
Municipalities: Grand Rapids, Perrysburg, Maumee, greater Toledo

Description
The Maumee River flows northeastward across northernwest Ohio, receiving CEC inputs from numerous WWTPs and CSOs, and empties into the western basin of Lake Erie. Most of the sampling sites are contained within the Maumee River Area of Concern, and two thirds of the Maumee River project location sampling sites were identified as potentially influenced by mapped CEC point sources. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Maumee River sampling sites evaluated for CEC hazards to fish.

Maumee River Project Location – Surface Water Sampling Sites (N) = Total Number of sampling events per site Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source			
1. CLARKO-6 (2)	**6. > MAU-DS-PB-WWTP (2)**	**11. > MAU-N-EW-PB-WWTP (1)**	**16. > MAU-WAT-1 (1)**
2. > MAU-BVP (1)	**7. > MAU-DS-WWTP (1)**	12. MAU-PB-WWTP (1)	**17. > MAU-WAT-2 (1)**
3. > MAU-CSO-68 (1)	**8. > MAU-Distal-DS-WWTP (5)**	**13. > MAU-TOL-WWTP (1)**	**18. > MX-WWTP (5)**
4. > MAU-CSO-9 (2)	**9. > MAU-GR-1 (1)**	14. MAU-US-CSO-9 (1)	**19. > SWANC-5 (5)**
5. > MAU-DS-CSO-9 (1)	**10. > MAU-LASALLE (1)**	15. MAU-US-WWTP (5)	**20. > TOLEDO-7 (3)**

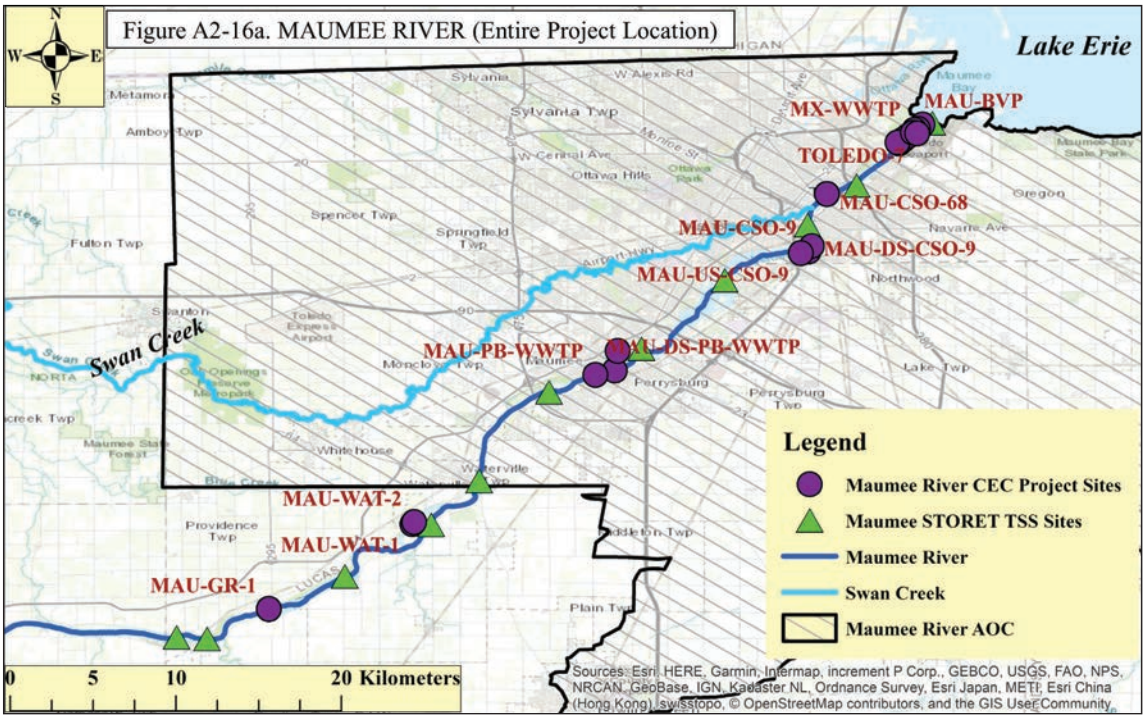


Figure A2-16 (a to e). Maumee River Sampling Station Maps. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate direction of flow.

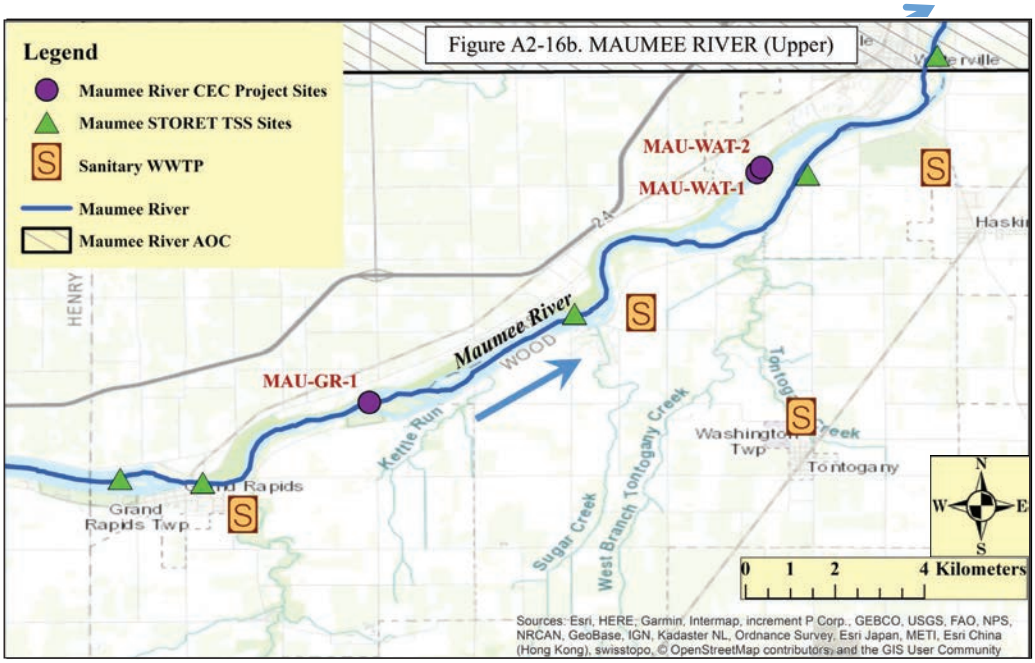


Figure A2-16b. MAUMEE RIVER (Upper)
Legend
Maumee River CEC Project Sites
Maumee STORET TSS Sites
Sanitary WWTP
Maumee River
Maumee River AOC
MAU-WAT-2
MAU-WAT-1
MAU-GR-1
Maumee River
Kettle Run
Sugar Creek
West Branch Tontogany Creek
Tontogany
Washington Twp
Grand Rapids Twp
HENRY
WOOD
N
W
E
S
0 1 2 4 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

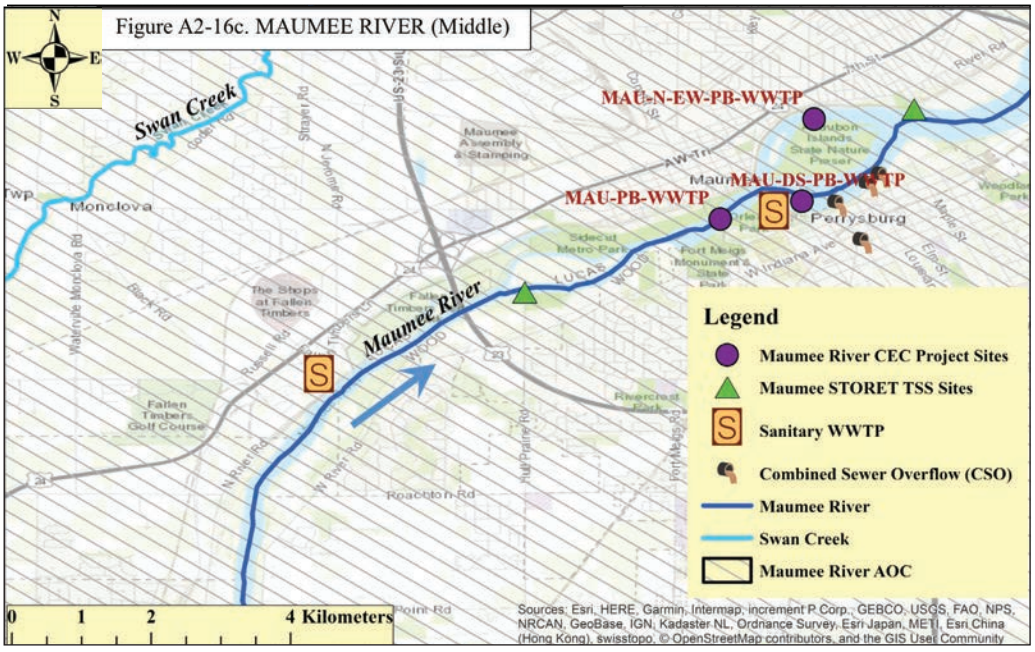


Figure A2-16c. MAUMEE RIVER (Middle)
Swan Creek
Maumee River
MAU-N-EW-PB-WWTP
MAU-DS-PB-WWTP
MAU-PB-WWTP
Perrysburg
Maumee
Monclova
Fallen Timbers Golf Course
Roachton Rd
Legend
Maumee River CEC Project Sites
Maumee STORET TSS Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Maumee River
Swan Creek
Maumee River AOC
0 1 2 4 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community


Figure A2-16d.
MAUMEE RIVER
(Lower Middle)
MAU-CSO-68
Toledo
Swan Creek
MAU-DS-CSO-9
MAU-CSO-9
MAU-US-CSO-9
Maumee River
Legend
Maumee River CEC Project Sites
Maumee STORET TSS Sites
Combined Sewer Overflow (CSO)
Maumee River
Swan Creek
Maumee River AOC
0 0.5 1 2 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

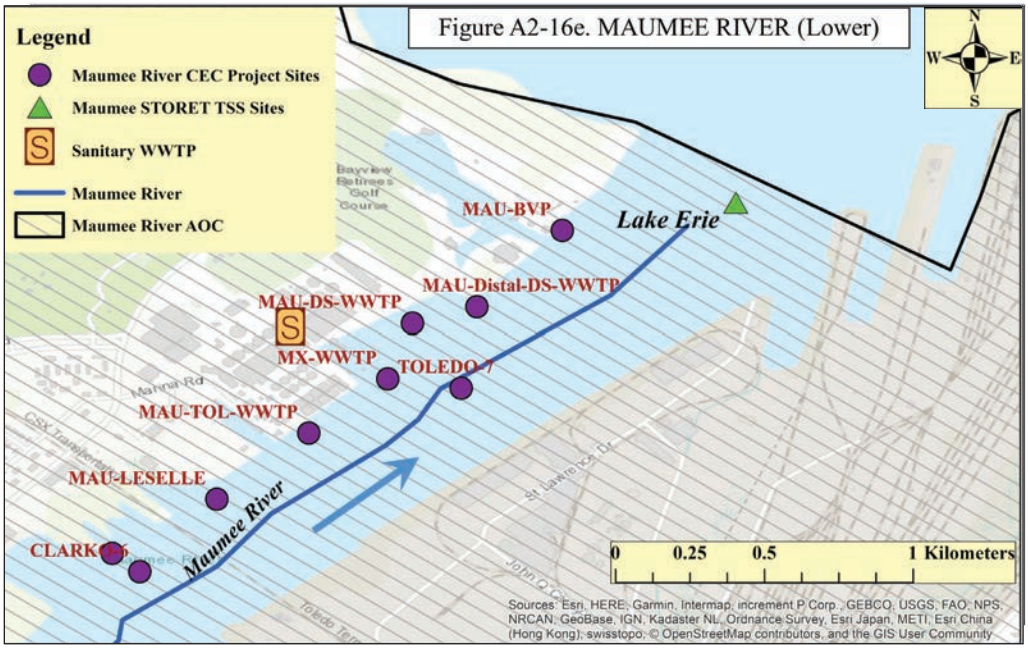


Figure A2-16e. MAUMEE RIVER (Lower)
Legend
Maumee River CEC Project Sites
Maumee STORET TSS Sites
Sanitary WWTP
Maumee River
Maumee River AOC
MAU-BVP
Lake Erie
MAU-Distal-DS-WWTP
MAU-DS-WWTP
MX-WWTP
TOLEDO 7
MAU-TOL-WWTP
MAU-LESELLE
CLARK 6
Maumee River
0 0.25 0.5 1 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

A2.17 Cuyahoga River

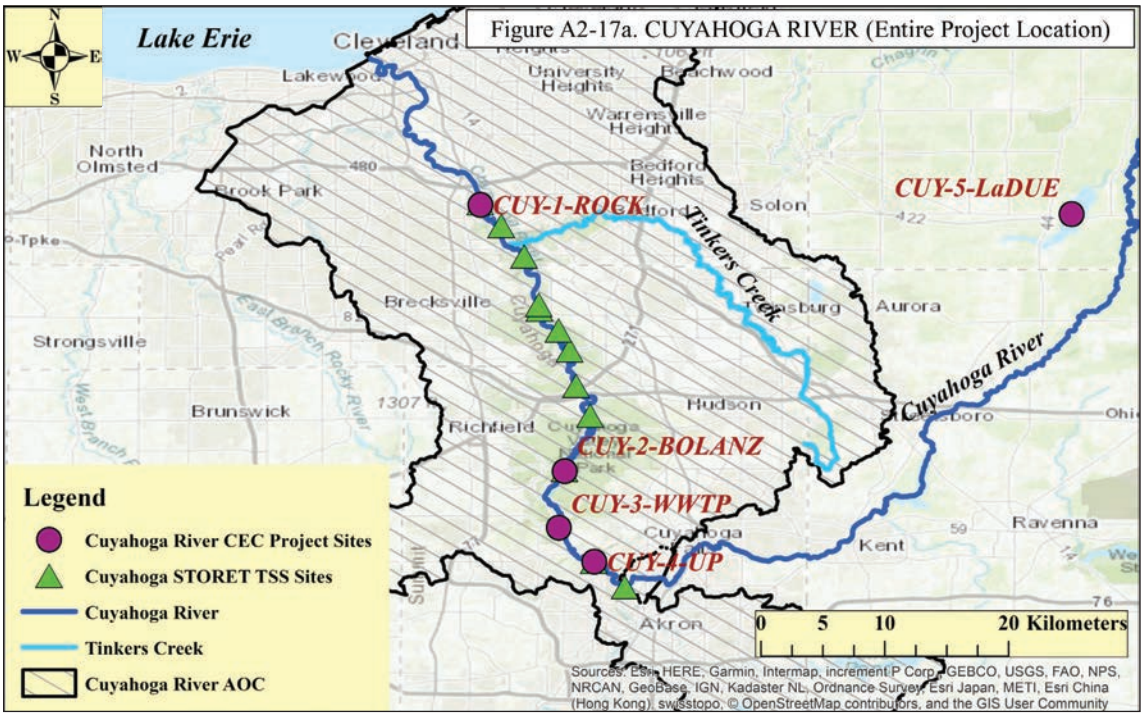
Political Units
State(s): Ohio
Municipalities: Newburgh Heights, Independence, Cuyahoga Falls, Akron, Cleveland

Description
The Cuyahoga River flows north in central Ohio, emptying into Lake Erie at Cleveland, OH. The river receives CEC inputs from numerous WWTPs and CSOs throughout its length. Effluent from these point sources sometimes exceeds river base flow. Four of the five CEC sampling sites in this project location fall within the Cuyahoga River Area of Concern, upstream of Cleveland. The fifth site is located in the LaDue reservoir upstream of the AOC.

Cuyahoga River sampling sites evaluated for CEC hazards to fish.

Cuyahoga River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. CUY-1-ROCK (5)
2. CUY-2-BOLANZ (5)
3. **> CUY-3-WWTP (8)**
4. **> CUY-4-UP (5)**
5. **> CUY-5-LaDUE (5)**



Figures A2-17 (a to d). Cuyahoga River Sampling Station Maps. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate direction of flow.

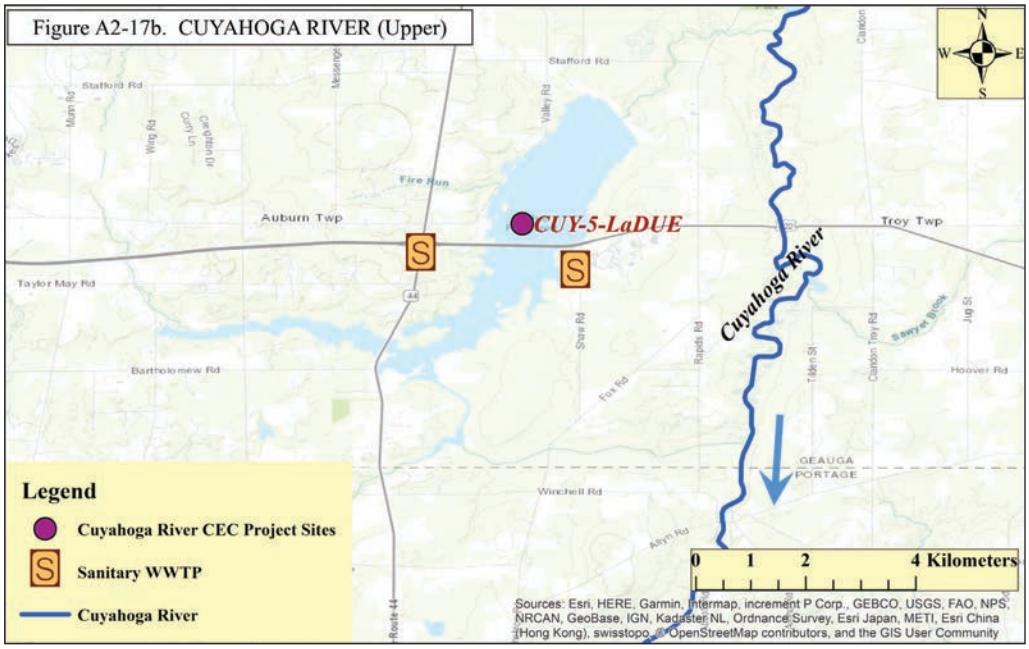


Figure A2-17b. CUYAHOGA RIVER (Upper)
CUY-5-LaDUE
Cuyahoga River
Auburn Twp
Troy Twp
Legend
Cuyahoga River CEC Project Sites
Sanitary WWTP
Cuyahoga River
0 1 2 4 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

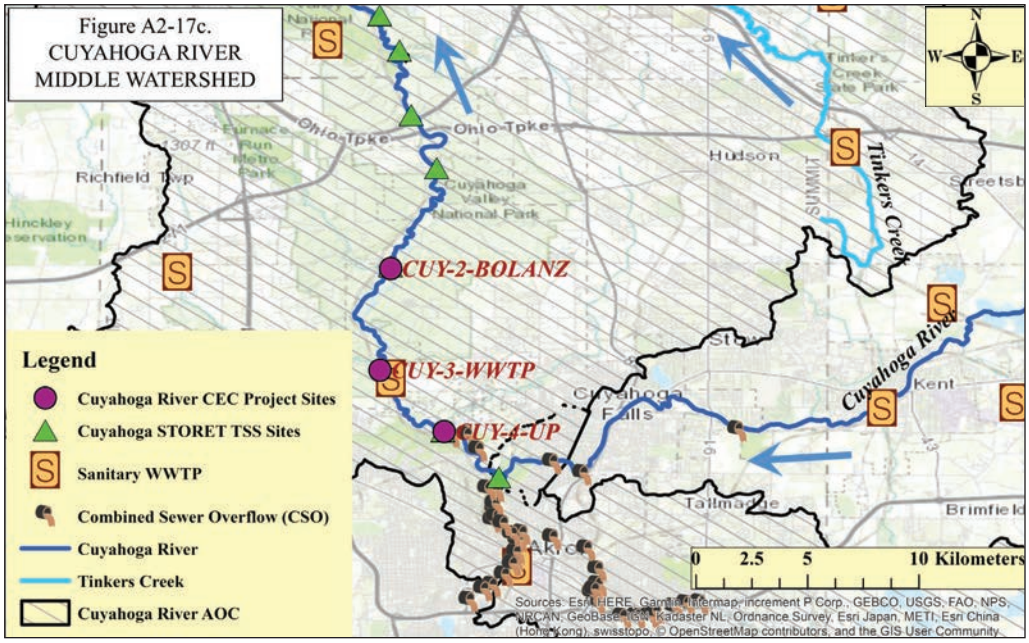


Figure A2-17c.
CUYAHOGA RIVER
MIDDLE WATERSHED
CUY-2-BOLANZ
CUY-3-WWTP
CUY-4-UP
Tinkers Creek
Cuyahoga River
Legend
Cuyahoga River CEC Project Sites
Cuyahoga STORET TSS Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Cuyahoga River
Tinkers Creek
Cuyahoga River AOC
0 2.5 5 10 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

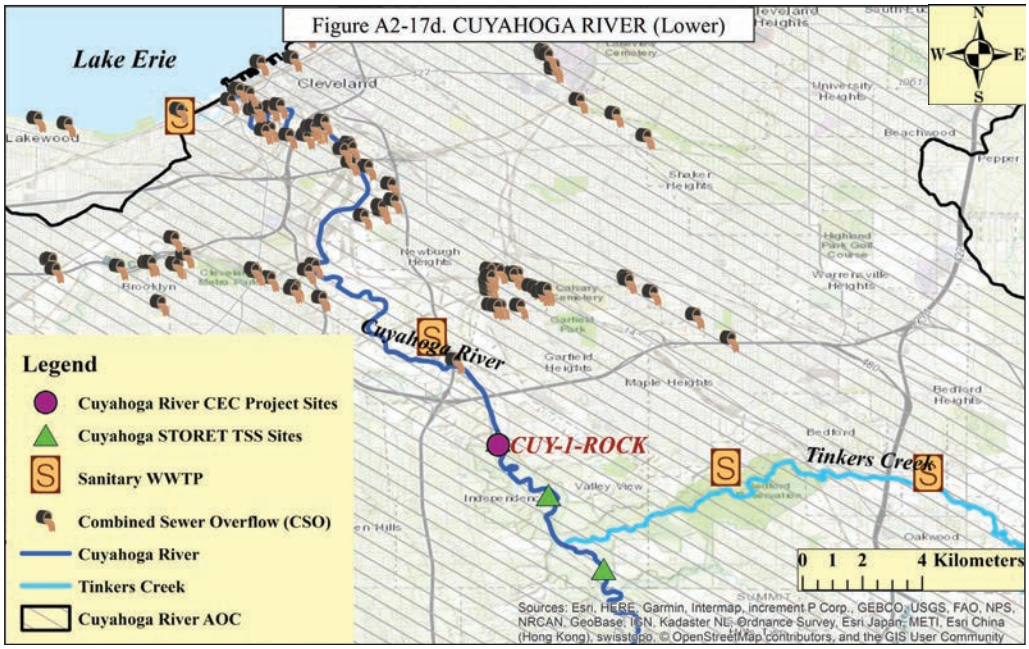


Figure A2-17d. CUYAHOGA RIVER (Lower)
Lake Erie
CUY-1-ROCK
Cuyahoga River
Tinkers Creek
Legend
Cuyahoga River CEC Project Sites
Cuyahoga STORET TSS Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Cuyahoga River
Tinkers Creek
Cuyahoga River AOC
0 1 2 4 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

A2.18 Tinkers Creek

Political Units
State(s): Ohio
Municipalities: Bedford, Bedford Heights, Glenwillow, Hudson, Streetsboro, Solon, Twinsburg, Valley View

Description
Tinkers Creek is a tributary of the Cuyahoga River. The creek receives inputs from numerous WWTPs that collectively contribute more to the creek's total discharge than the natural base flow. The entire project area lies within the Cuyahoga River Area of Concern, and six of the nine sites were identified as potentially influenced by mapped CEC point sources.

Tinkers Creek sampling sites evaluated for CEC hazards to fish.

Tinkers Creek Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. TIC-1 (3)
2. **> TIC-2 (3)**
3. TIC-3 (3)
4. **> TIC-4 (3)**
5. **> TIC-5 (6)**
6. **> TIC-6 (3)**
7. **> TIC-7 (3)**
8. **> TIC-8 (6)**
9. TIC-9 (3)

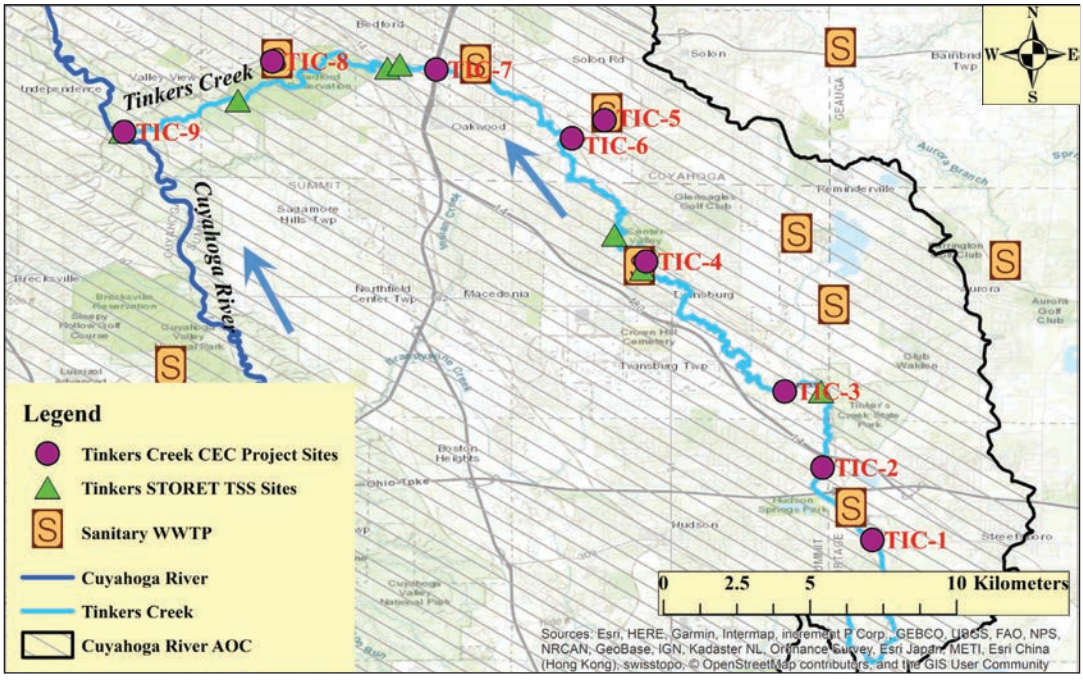


Figure A2-18. Tinkers Creek Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database. Arrows indicate direction of flow.

A2.19 Ashtabula River

Political Units
State(s): Ohio
Municipality: Ashtabula

Description
The Ashtabula River flows north into southcentral Lake Erie. All three CEC sampling sites fall within the Ashtabula River Area of Concern in the lower river. No mapped point sources were identified upstream of sampling sites within this project location. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Ashtabula River sampling sites evaluated for CEC hazards to fish.

Ashtabula River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** ***None*** of these Sites was Identified as Potentially Influenced by Point Sources 1. ASH-1 (1) 2. ASH-2 (1) 3. ASH -3 (1)

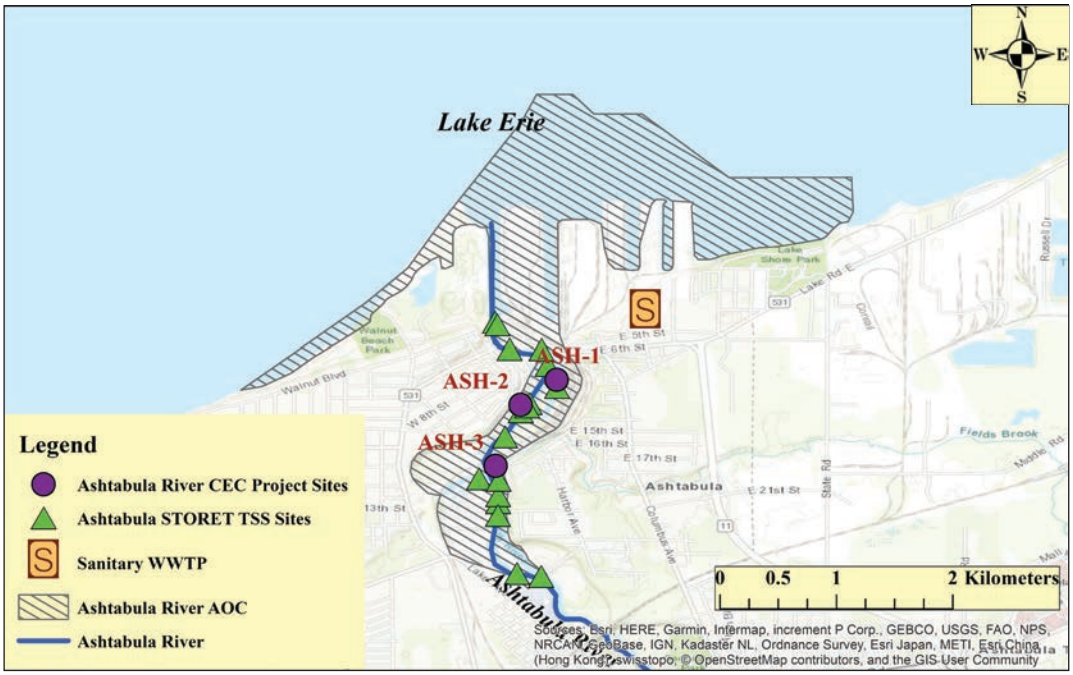


Figure A2-19. Ashtabula River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.20 Long Pond

Political Units
State(s): New York
Municipalities: Spencerport, Greece

Description
Long Pond is a coastal embayment on the south central shore of Lake Ontario, which is separated from the lake by a barrier sand bar that historically was transient but has been developed and permanently hardened. The pond is immediately adjacent to, and discharges into, the Rochester Embayment Area of Concern. It had received CEC inputs for many decades from a WWTP located eight miles (13 km) upstream on its major tributary (Northrup Creek) at Spencerport, which ceased operation a few years prior to sampling. Since there was no known on-going point source discharge, all sites were designated as currently "uninfluenced" by CEC point sources. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017). Water quality data were obtained in Makarewicz and Nowak (2010).

Long Pond sampling sites evaluated for CEC hazards to fish

Long Pond Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
None of these Sites was Identified as Potentially Influenced by Point Sources

1. LP01 (1)
2. LP02 (1)
3. LP04 (1)
4. LP06 (1)
5. LP06-REF (1)
6. LP_South (1)

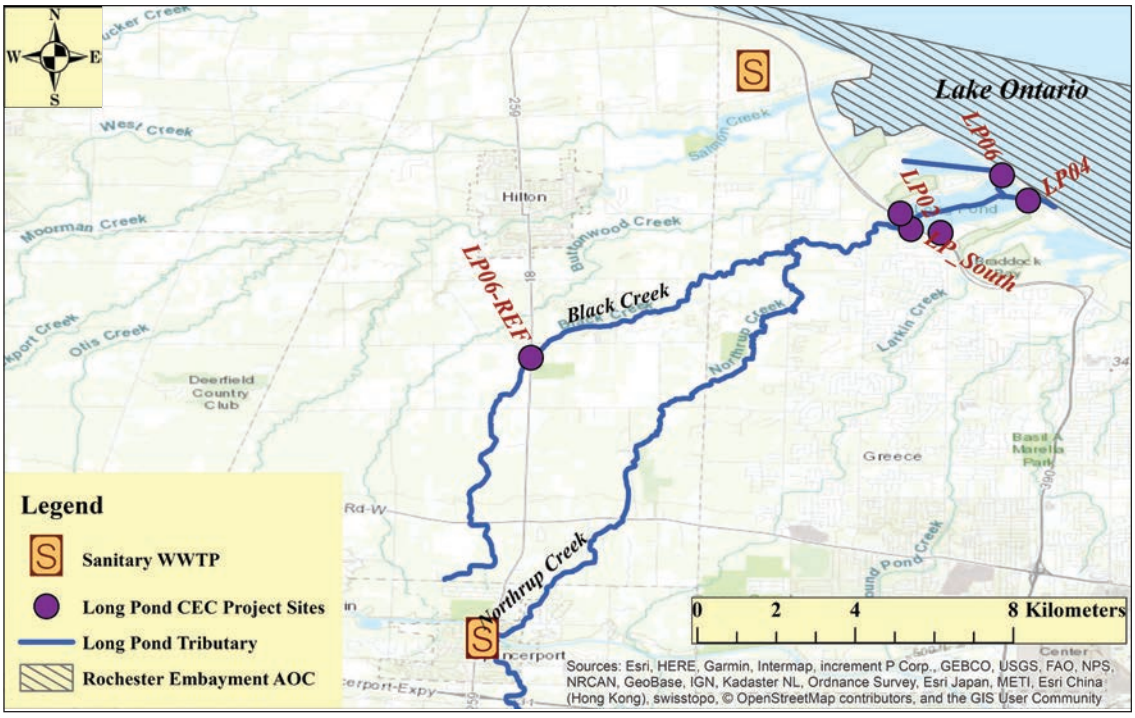


Figure A2-20. Long Pond Sampling Station Map. Surface water CEC concentrations were determined at the CEC project sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in Makarewicz and Nowak (2010).

A2.21 Genesee River

Political Units
State(s): New York
Municipalities: Rochester

Description
The Genesee River flows north from Pennsylvania to Rochester through predominantly agricultural areas including the western Finger Lakes region, with CEC point sources at numerous municipalities within the drainage. The project location is the lowermost six-mile reach of the river extending from the Lower Falls in Rochester to its mouth on south shore of Lake Ontario at the Port of Rochester. The lower Genesee River is part of the Rochester Embayment Area of Concern; all six of the CEC sampling sites fall within the AOC. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Genesee River sampling sites evaluated for CEC hazards to fish

Genesee River Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** **Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source**	
1. GNR-1 (2)	**4. > GNR -4 (1)**
2. > GNR-2 (2)	**5. > GNR -5 (1)**
3. > GNR -3 (1)	6. GNR -6 (2)

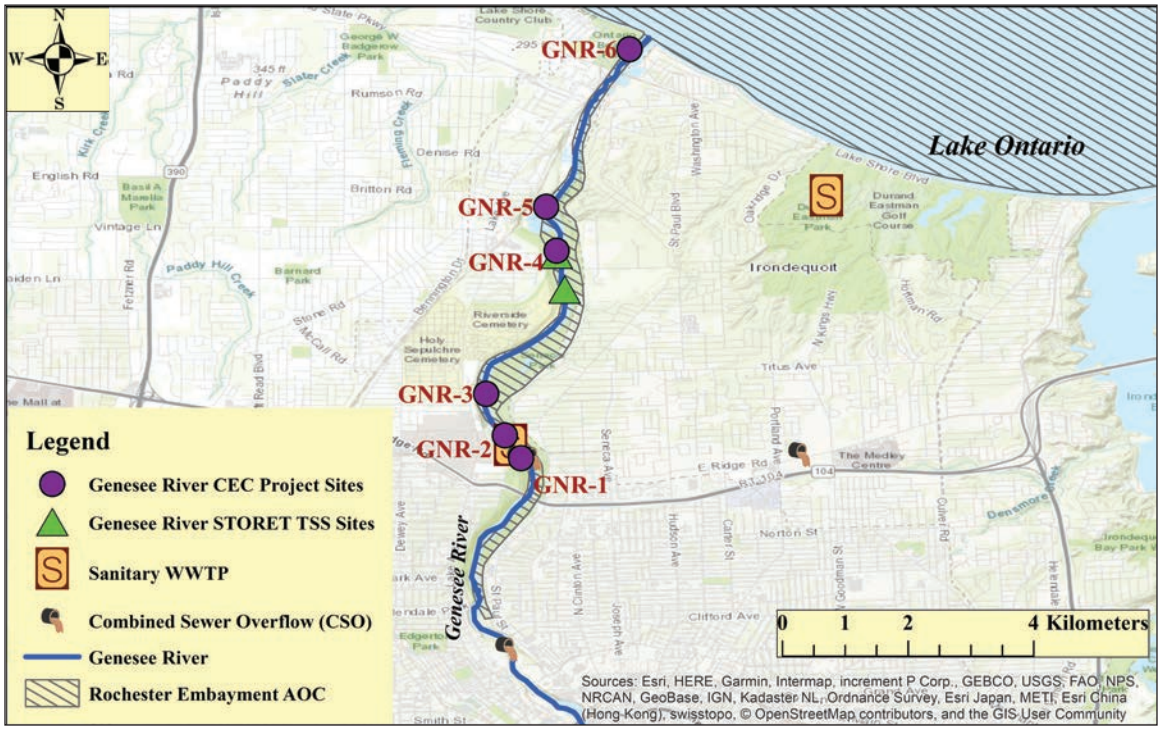


Figure A2-21. Genesee River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.22 Irondequoit Bay

Political Units
State(s): New York
Municipalities: Irondequoit, Webster, Rochester, Penfield, East Rochester

Description
Irondequoit Bay is a natural harbor on the south shore of Lake Ontario that discharges directly into the Rochester Embayment Area of Concern. The Bay received CEC inputs for decades from WWTPs at municipalities on its principal tributary, Irondequoit Creek. The WWTPs closed operation a few years prior to sampling, so all sites were designated as currently "uninfluenced" by CEC point sources. Characteristics of this location and associations between CEC concentrations and watershed land cover are further described in Choy et al. (2017).

Irondequoit Bay sampling sites evaluated for CEC hazards to fish

Irondequoit Bay Project Location – Surface Water Sampling Sites **(N) = Total Number of sampling events per site** ***None*** of these Sites was Identified as Potentially Influenced by Point Sources	
1. IB_04 (1) 2. IB_05 (1) 3. IB_06 (1)	4. IB_06_REF (1) 5. IB_NW_PHRAG (1) 6. IB_NE_DUNE (1)

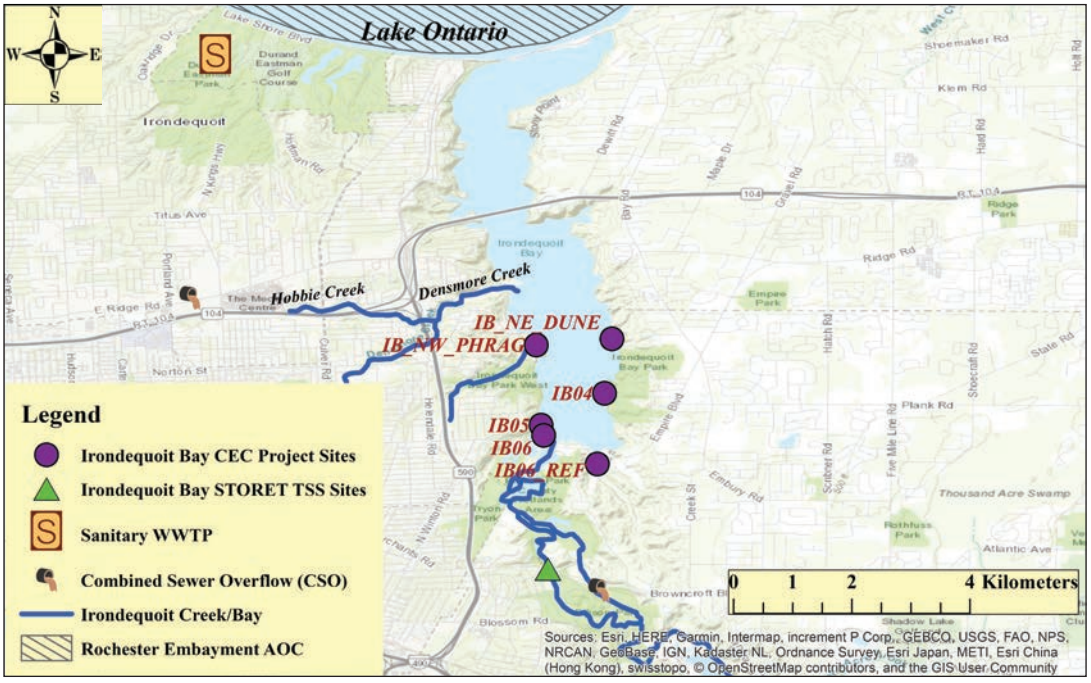


Figure A2-22. Irondequoit Creek/Bay Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.23 Oswegatchie River

Political Units
State(s): New York
Municipalities: Wanakena, Cranberry Lake, Newton Falls, Edwards

Description
The Oswegatchie River flows north from its headwaters in the Adirondack wilderness through numerous small municipalities to its mouth at the St. Lawrence River. The river discharges a few miles upstream of the St. Lawrence Massena Area of Concern. Sampling sites in the project area are well upstream of the St. Lawrence River in impoundments and main channel of the river, in areas associated with municipal WWTPs and an abandoned paper mill. Known legacy contamination is limited to inorganics associated with localized mining operations. Brandy Brook bay in Cranberry Lake served as the reference site.

Oswegatchie River sampling sites evaluated for CEC hazards to fish

Oswegatchie River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. OSW-1 (5)
2. **> OSW -2 (7)**
3. OSW -3 (6)
4. OSW -4 (6)
5. **> OSW -5 (7)**

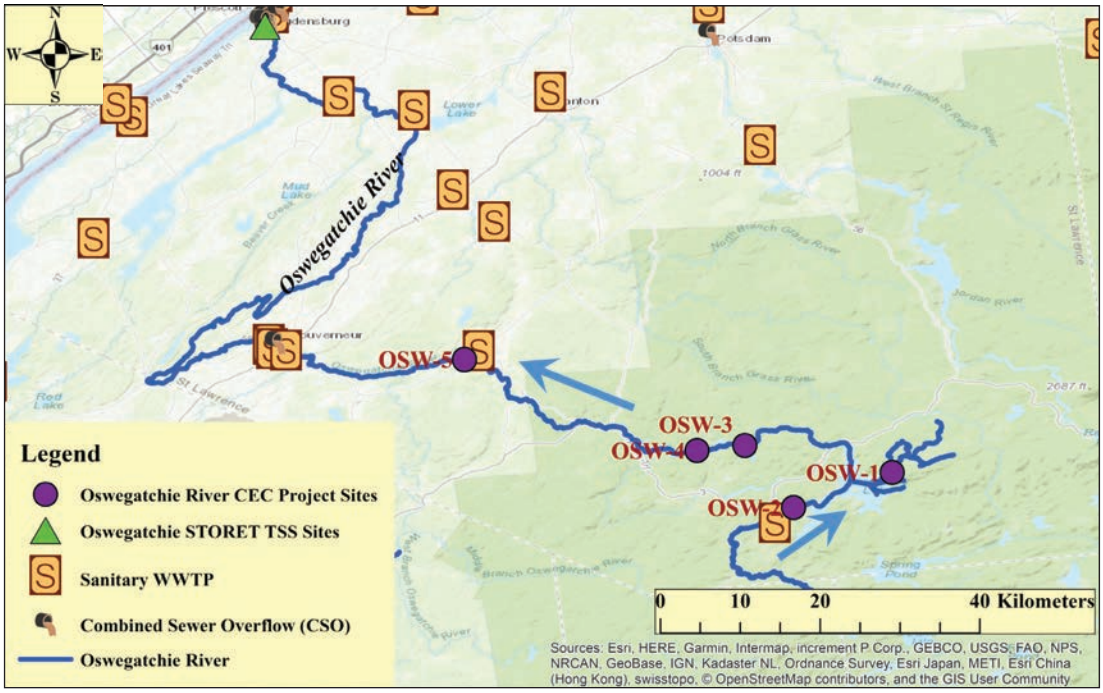


Figure A2-23. Oswegatchie River Sampling Station Map. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on historical water quality data reported in the USEPA STORET database.

A2.24 Raquette River

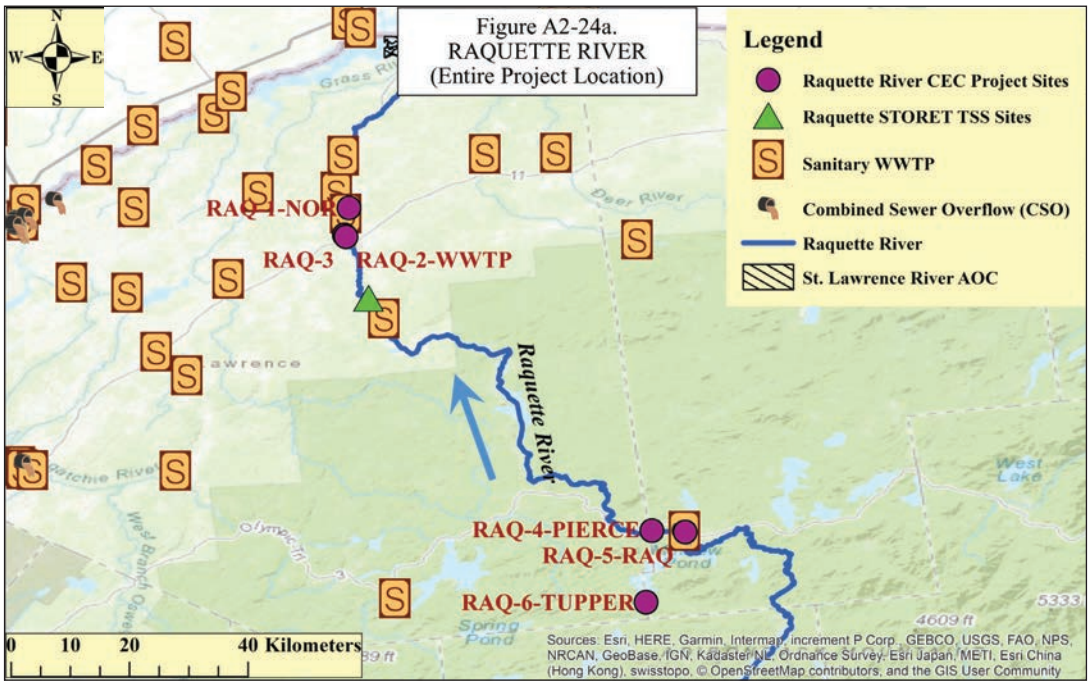
Political Units
State(s): New York
Municipalities: Tupper Lake, Colton, Potsdam, Hewittville

Description
The Raquette River flows north from its headwaters in the Adirondack wilderness through numerous small municipalities and impoundments to its mouth at the St. Lawrence Massena AOC on the St. Lawrence River. Sampling sites in the project area are well upstream of the AOC in impoundments on the river that are associated with WWTPs and CSOs in several municipalities.

Raquette River sampling sites evaluated for hazard to fish.

Raquette River Project Location – Surface Water Sampling Sites
(N) = Total Number of sampling events per site
Bold ">" = Identified as Potentially Influenced by mapped CEC Point Source

1. **>RAQ-1-NOR (8)**
2. **>RAQ-2-WWTP (8)**
3. RAQ-3 (6)
4. RAQ-4-PIERCE (8)
5. **>RAQ-5-RAQ (8)**
6. RAQ-6-TUPPER (8)



Figures A2-24 (a to c). Raquette River Sampling Station Maps. Surface water CEC concentrations were determined at the CEC projects sites. Measured total CEC concentrations for certain CECs were adjusted to estimated aqueous concentrations based in part on water quality data from historical data reported in the USEPA STORET database. Arrows indicate direction of flow.

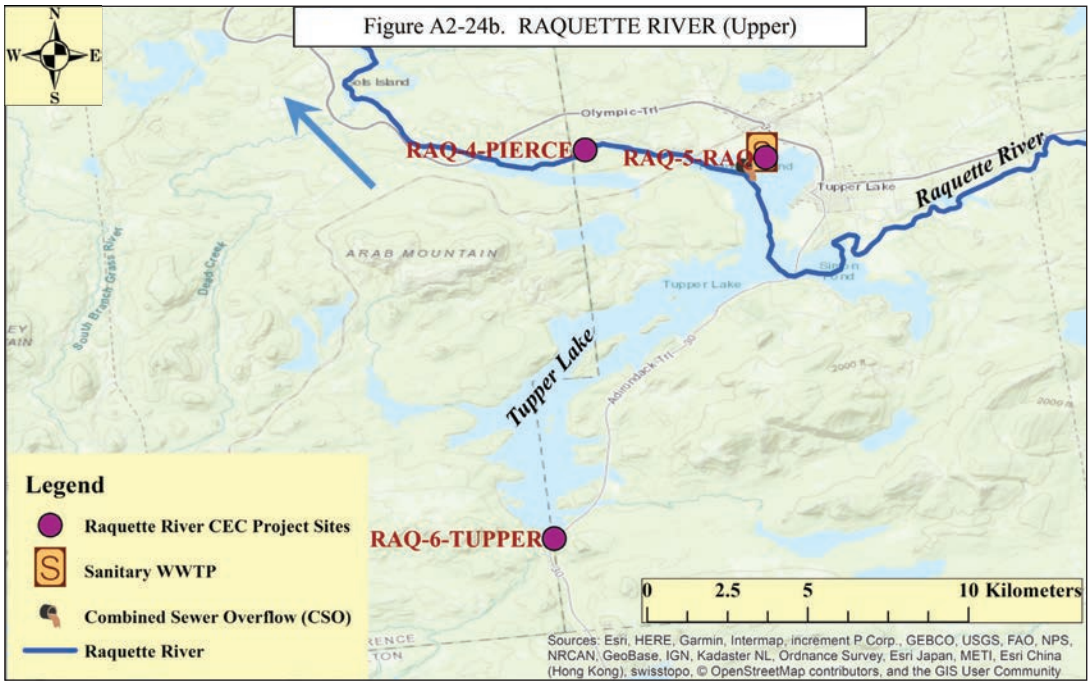


Figure A2-24b. RAQUETTE RIVER (Upper)
RAQ-4-PIERCE
RAQ-5-RAQ
RAQ-6-TUPPER
Raquette River
Tupper Lake
ARAB MOUNTAIN
Olympic Trl
Legend
Raquette River CEC Project Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Raquette River
0 2.5 5 10 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

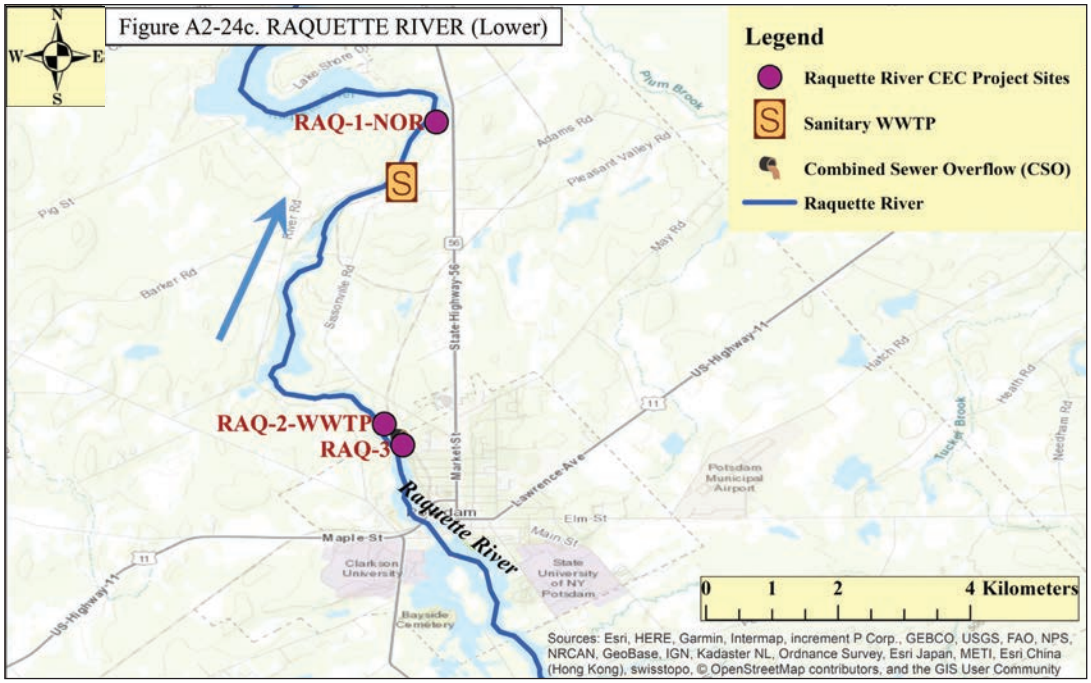


Figure A2-24c. RAQUETTE RIVER (Lower)
RAQ-1-NOR
RAQ-2-WWTP
RAQ-3
Raquette River
Legend
Raquette River CEC Project Sites
Sanitary WWTP
Combined Sewer Overflow (CSO)
Raquette River
0 1 2 4 Kilometers
Sources: Esri, HERE, Garmin, Intermap, increment P Corp., GEBCO, USGS, FAO, NPS, NRCAN, GeoBase, IGN, Kadaster NL, Ordnance Survey, Esri Japan, METI, Esri China (Hong Kong), swisstopo, © OpenStreetMap contributors, and the GIS User Community

ATTACHMENT B

Mean and Maximum Hazard Scores by Sampling Site, CEC, and Effect Category.

Mean hazard scores were developed simply to summarize hazard score information; they were used for broad, qualitative, rapid comparisons by inspection between sites, CECs, and effect categories. Mean hazard scores were not used in the non-parametric statistical comparison tests described in Chapter 5 or Attachment D.

Table B-1a. St. Louis River/Bay project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no chemical analytical results. *Red shading*: at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Comprehensive SVs													Circulatory/ Blood Constituents			Endocrine			Genotoxicity
	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine	Carbamazepine	DEET	Sitosterol, beta-	DEET	Ibuprofen	Venlafaxine	Ibuprofen
> BlatnikBr		2,2 (2)			2,2 (2)				2,2 (2)								2.5,3 (2)			3,3 (2)
CloquetDW																	2,2 (2)			
CloquetUP																	2,2 (2)			
CloughId																	2,2 (2)			
> EriePr					1.5,2 (8)										1.1,2 (8)	1.3,2 (8)	1.9,3 (8)			
FDL					1.1,2 (10)												1.6,2 (10)			
FondDu																	2,2 (2)			
GrassyPt					1.2,2 (6)											1.3,2 (6)	1.7,2 (6)			
> HogIsland					1.8,2 (5)		1.2,2 (5)		1.2,2 (5)		1.8,2 (5)	1.2,2 (5)			1.2,2 (5)	1.2,2 (5)	2.2,3 (5)			1.4,3 (5)
MudLk																	2,2 (2)			
NekukId																	2,2 (2)			
> RicesPt		1.1,2 (8)			1.4,2 (8)				1.1,2 (8)						1.1,2 (8)	1.4,2 (8)	2.1,3 (8)			1.3,3 (8)

Table B-1a. Comprehensive effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Comprehensive SVs													Circulatory/ Blood Constituents			Endocrine			Genotoxicity
	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine	Carbamazepine	DEET	Sitosterol, beta-	DEET	Ibuprofen	Venlafaxine	Ibuprofen
> SMTP	1.1,2 (9)	1.1,2 (9)	1.1,2 (10)	1.1,2 (10)	1.8,2 (10)	1.3,2 (10)	1.4,2 (9)	1.4,2 (10)	1.8,2 (5)		1.7,2 (10)	1.4,2 (10)	1.7,2 (10)	1.1,2 (10)	1.2,2 (10)	1.1,2 (10)	2.2,3 (10)		2.1,3 (10)	2.6,3 (5)
> STB-MP-1																	2,2 (1)			
> STB-MP-2																	2,2 (1)			
> STB-MP-3																	2,2 (1)			
> STB-MP-4					2,2 (1)												2,2 (1)			
> STB-MP-5																	2,2 (1)			
> STB-MP-6																	2,2 (1)			
> STB-WLSSD-1		1.3,2 (6)		1.7,2 (6)	2,2 (6)	1.5,2 (6)	1.7,2 (6)				1.5,2 (6)	1.7,2 (6)	2,2 (6)		2,2 (6)	1.2,2 (6)	3,3 (6)		2.2,3 (6)	
> STB-WLSSD-2	2,2 (1)				2,2 (1)	2,2 (1)	2,2 (1)				2,2 (1)		2,2 (1)			2,2 (1)	3,3 (1)		3,3 (1)	
> STB-WLSSD-3				2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)		3,3 (1)		3,3 (1)	3,3 (1)
> STB-WLSSD-4/ WLSSD-DISTAL		1.3,2 (19)	1.2,2 (19)	1.4,2 (19)	1.9,2 (19)	1.5,2 (19)	1.7,2 (19)	1.2,2 (19)	1.3,2 (14)		1.6,2 (19)	1.4,2 (19)	1.7,2 (19)	1.2,2 (19)	1.7,2 (19)	1.1,2 (19)	2.8,3 (19)		2.4,3 (19)	1.6,3 (14)
> STB-WLSSD-5					2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)	2,2 (1)	3,3 (1)	2,2 (1)	3,3 (1)	3,3 (1)
STR-FDL-1					2,2 (1)												2,2 (1)			
STR-FDL-2																	2,2 (1)			

Table B-1a. Comprehensive effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**													**Circulatory/ Blood Constituents**			**Endocrine**			**Genotoxicity**
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**	**DEET**	**Ibuprofen**	**Venlafaxine**	**Ibuprofen**
STR-FDL-3																	2,2 (1)			
STR-FDL-4																	2,2 (1)			
STR-FDL-5																				
STR-FDL-6																	2,2 (1)			
TallasId																	2,2 (2)			
WireMi													1.5,2 (2)				2,2 (2)		3,3 (2)	

Table B-1a continued. St. Louis River/Bay project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading*: at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Gross Pathology**	**Histo-pathology**		**Neurological**	**Physiological/Metabolic**			
	Bisphenol A	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**	**Ibuprofen**
> **BlatnikBr**	1.3,1.5 (2)							
CloquetDW								
CloquetUP								
CloughId								
> **EriePr**								
FDL								
FondDu								
GrassyPt								
> **HogIsland**						1.2,2 (5)	1.8,2 (5)	
MudLk								
NekukId								
> **RicesPt**							1.3,2 (8)	
> **SMTP**		1.1,2 (10)	1.7,2 (10)	1.1,2 (10)	1.1,2 (10)	1.4,2 (9)	1.8,2 (10)	
> **STB-MP-1**								
> **STB-MP-2**								
> **STB-MP-3**								
> **STB-MP-4**								
> **STB-MP-5**								
> **STB-MP-6**								

Table B-1a. Comprehensive effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Gross Pathology**	**Histo-pathology**		**Neurological**	**Physiological/Metabolic**			
	Bisphenol A	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**	**Ibuprofen**
> STB-WLSSD-1			2,2 (6)			1.8,3 (6)	1.8,2 (6)	
> STB-WLSSD-2			2,2 (1)			3,3 (1)	2,2 (1)	
> STB-WLSSD-3			2,2 (1)			3,3 (1)	2,2 (1)	
> STB-WLSSD-4/ WLSSD-DISTAL	1.2,2 (19)	1.2,2 (19)	1.7,2 (19)	1.2,2 (19)	1.2,2 (19)	1.8,3 (19)	1.8,2 (19)	
> STB-WLSSD-5			2,2 (1)			3,3 (1)	2,2 (1)	2,2 (1)
TallasId								
WireMi			1.5,2 (2)					

Table B-1b. St. Louis River/Bay project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\overline{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading*: at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**									**Behavioral**							
	Bisphenol A	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
> BlatnikBr	2,2 (2)		2,2 (2)			2,2 (2)											
CloquetDW			2,2 (2)														
CloquetUP			2,2 (2)														
CloughId			2,2 (2)														
> EriePr			1.6,2 (8)												1.6,2 (8)		
FDL			1.6,2 (10)												1.1,2 (10)		
FondDu			2,2 (2)														
GrassyPt			1.7,2 (6)												1.5,2 (6)		
> HogIsland			2,2 (5)		1.2,2 (5)	1.2,2 (5)		1.2,2 (5)						1.2,2 (5)	1.6,2 (5)	1.2,2 (5)	
MudLk			2,2 (2)														
NekukId			2,2 (2)												1.5,2 (2)		
> RicesPt	1.1,2 (8)		2,2 (8)			1.1,2 (8)									1.4,2 (8)		
> SMTP	1.1,2 (9)	1.1,2 (10)	1.9,2 (10)	1.1,2 (10)	1.4,2 (9)	1.8,2 (5)	1.2,2 (10)	1.4,2 (10)	1.7,2 (10)		1.1,2 (10)	1.1,2 (10)	1.3,2 (10)	1.4,2 (9)	1.4,2 (10)	1.4,2 (10)	1.7,2 (10)
> STB-MP-1			2,2 (1)														

Table B-1b. Population effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**									**Behavioral**							
	Bisphenol A	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
> STB-MP-2			2,2 (1)														
> STB-MP-3			2,2 (1)														
> STB-MP-4			2,2 (1)														
> STB-MP-5			2,2 (1)														
> STB-MP-6			2,2 (1)														
> STB-WLSSD-1	1.1,1.5 (6)	1.7,2 (6)	2,2 (6)	1.2,2 (6)	1.7,2 (6)			1.7,2 (6)	2,2 (6)			1.7,2 (6)	1.2,2 (6)	1.7,2 (6)	1.2,2 (6)	1.7,2 (6)	2,2 (6)
> STB-WLSSD-2			2,2 (1)	2,2 (1)	2,2 (1)				2,2 (1)				2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)
> STB-WLSSD-3		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)			2,2 (1)	2,2 (1)	2,2 (1)			2,2 (1)
> STB-WLSSD-4/ WLSSD-DISTAL	1.3,2 (19)	1.4,2 (19)	2,2 (19)	1.3,2 (19)	1.7,2 (19)	1.3,2 (14)	1.1,2 (19)	1.4,2 (19)	1.7,2 (19)	1,1.5 (19)	1.2,2 (19)	1.4,2 (19)	1.4,2 (19)	1.7,2 (19)	1.5,2 (19)	1.4,2 (19)	1.7,2 (19)
> STB-WLSSD-5			2,2 (1)	2,2 (1)	2,2 (1)	3,3 (1)			2,2 (1)				2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)
STR-FDL-1			2,2 (1)														
STR-FDL-2			2,2 (1)														
STR-FDL-3			2,2 (1)														
STR-FDL-4			2,2 (1)														
STR-FDL-5																	
STR-FDL-6			2,2 (1)														

Table B-1b. Population effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**									**Behavioral**							
	Bisphenol A	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
TallasId			2,2 (2)														
WireMi			2,2 (2)						1.5,2 (2)								1.5,2 (2)

Table B-1b continued. St. Louis River/Bay project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**						**Growth**	**Mortality**						**Reproductive**					
	Bisphenol A	**Carbamazepine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Bisphenol A**	**Bisphenol A**	**DEET**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Triclosan**	**Venlafaxine**
> BlatnikBr	2,2 (2)			2,2 (2)			1.8,2 (2)		2,2 (2)	2,2 (2)				2,2 (2)			2,2 (2)		
CloquetDW									2,2 (2)										
CloquetUP									2,2 (2)										
CloughId									2,2 (2)										
> EriePr									1.6,2 (8)										
FDL									1.6,2 (10)										
FondDu									2,2 (2)										
GrassyPt									1.7,2 (6)										
> HogIsland			1.2,2 (5)	1.2,2 (5)		1.2,2 (5)			2,2 (5)	1.2,2 (5)		1.2,2 (5)				1.2,2 (5)	1.2,2 (5)	1.2,2 (5)	
MudLk									2,2 (2)										
NekukId									2,2 (2)										
> RicesPt	1.1,2 (8)			1.1,2 (8)			1.1,1.5 (8)		2,2 (8)	1.1,2 (8)				1.1,2 (8)			1.1,2 (8)		
> SMTP	1.1,2 (9)	1.1,2 (10)	1.4,2 (9)	1.8,2 (5)	1.4,2 (10)	1.4,2 (10)	1.1,2 (9)		1.9,2 (10)	1.8,2 (5)	1.2,2 (10)	1.4,2 (10)	1.7,2 (10)	1.1,2 (9)	1.1,2 (10)	1.4,2 (9)	1.8,2 (5)	1.4,2 (10)	1.7,2 (10)
> STB-MP-1									2,2 (1)										

Table B-1b. Population effect categories (**continued**)

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Developmental						Growth	Mortality						Reproductive					
	Bisphenol A	Carbamazepine	Estrone	Ibuprofen	TBEP	Triclosan	Bisphenol A	Bisphenol A	DEET	Ibuprofen	TBEP	Triclosan	Venlafaxine	Bisphenol A	Carbamazepine	Estrone	Ibuprofen	Triclosan	Venlafaxine
> STB-MP-2									2,2 (1)										
> STB-MP-3									2,2 (1)										
> STB-MP-4									2,2 (1)										
> STB-MP-5									2,2 (1)										
> STB-MP-6									2,2 (1)										
> STB-WLSSD-1	1.3,2 (6)		1.7,2 (6)			1.7,2 (6)			2,2 (6)			1.7,2 (6)	2.2,3 (6)	1.3,2 (6)		1.7,2 (6)		1.7,2 (6)	2,2 (6)
> STB-WLSSD-2			2,2 (1)						2,2 (1)				2,2 (1)			2,2 (1)			2,2 (1)
> STB-WLSSD-3			2,2 (1)	2,2 (1)	2,2 (1)				2,2 (1)	2,2 (1)			3,3 (1)			2,2 (1)	2,2 (1)		2,2 (1)
> STB-WLSSD-4/ WLSSD-DISTAL	1.3,2 (19)	1.2,2 (19)	1.7,2 (19)	1.5,3 (14)	1.3,2 (19)	1.4,2 (19)	1.3,2 (19)	1.1,2 (19)	2,2 (19)	1.3,2 (14)		1.4,2 (19)	1.8,3 (19)	1.3,2 (19)	1.2,2 (19)	1.7,2 (19)	1.5,3 (14)	1.4,2 (19)	1.7,2 (19)
> STB-WLSSD-5			2,2 (1)	3,3 (1)	2,2 (1)				2,2 (1)	2,2 (1)			3,3 (1)			2,2 (1)	3,3 (1)		2,2 (1)
STR-FDL-1									2,2 (1)										
STR-FDL-2									2,2 (1)										
STR-FDL-3									2,2 (1)										
STR-FDL-4									2,2 (1)										
STR-FDL-5																			
STR-FDL-6									2,2 (1)										

Table B-1b. Population effect categories **(continued)**

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**						**Growth**	**Mortality**						**Reproductive**					
	Bisphenol A	**Carbamazepine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Bisphenol A**	**Bisphenol A**	**DEET**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Triclosan**	**Venlafaxine**
TallasId									2,2 (2)										
WireMi									2,2 (2)				1.5,2 (2)						1.5,2 (2)

Table B-2a. Waupaca Chain O'Lakes project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean values [$\bar{x}$]; in all cases N = 1 and max = mean. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading*: at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Comprehensive SVs		Circulatory/Blood Constituents	Endocrine	Physiological/ Metabolic
	DEET	Estrone	Sitosterol, beta-	DEET	Estrone
COL-1	2			3	
COL-2	2	2	2	3	2

Table B-2b. Waupaca Chain O'Lakes project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean values [$\bar{x}$]; in all cases N = 1 and max = mean. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading*: at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Population-relevant SVs		Behavioral		Developmental	Mortality	Reproductive
	DEET	Estrone	Estrone	Sitosterol, beta-	Estrone	DEET	Estrone
COL-1	2			2		2	
COL-2	2	2	2	2	2	2	2

Table B-3a. Little Lake Butte des Morts project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**									**Circulatory/Blood Constituents**			**Endocrine**	
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**	**DEET**	**Venlafaxine**
LLB-1					1.3,2 (4)	1.3,2 (4)				1.5,2 (4)		1.3,2 (4)	1.5,2 (4)	
LLB-2	1.1,2 (8)	1.1,1.5 (8)			1.1,2 (8)	1.4,2 (8)	1.1,2 (8)		1.1,2 (8)	1.4,2 (8)		1.3,2 (8)	1.4,2 (8)	1.1,2 (8)
> LLB-3		1.1,1.5 (8)	1.4,2 (8)	1.1,2 (8)	1.4,2 (8)	1.4,2 (8)		1.3,2 (8)	1.8,2 (8)	1.8,2 (8)	1.3,2 (8)	1.5,2 (8)	1.9,3 (8)	1.8,2 (8)
> LLB-4	1.3,2 (4)	1.1,1.5 (4)			1.3,2 (4)	1.3,2 (4)			1.3,2 (4)	1.8,2 (4)		1.5,2 (4)	1.5,2 (4)	1.3,2 (4)
> LLB-5		1.1,1.5 (4)			1.5,2 (4)	1.3,2 (4)	1.3,2 (4)	1.3,2 (4)	1.3,2 (4)	1.5,2 (4)		1.5,2 (4)	1.8,2 (4)	1.3,2 (4)

Table B-3a continued. Little Lake Butte des Morts project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	Carbamazepine	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
LLB-1	1.8,2 (4)		1.5,2 (4)	1.5,2 (4)	1.3,2 (4)	
LLB-2	1.5,2 (8)	1.1,2 (8)	1.4,2 (8)	1.4,2 (8)	1.5,3 (8)	1.1,2 (8)
> LLB-3	1.9,2 (8)	1.8,2 (8)	1.8,2 (8)	1.8,2 (8)	1.4,2 (8)	1.6,2 (8)
> LLB-4	1.8,2 (4)	1.3,2 (4)	1.8,2 (4)	1.8,2 (4)	1.3,2 (4)	1.5,2 (4)
> LLB-5	1.5,2 (4)	1.3,2 (4)	1.5,2 (4)	1.5,2 (4)	1.3,2 (4)	1.3,2 (4)

Table B-3b. Little Lake Butte des Morts project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**						**Behavioral**				
	Bisphenol A	**Citalopram**	**DEET**	**Estrone**	**Triclosan**	**Venlafaxine**	**Citalopram**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
LLB-1			1.5,2 (4)	1.3,2 (4)				1.3,2 (4)	1.8,2 (4)		
LLB-2	1.1,1.5 (8)		1.4,2 (8)	1.4,2 (8)				1.4,2 (8)	1.4,2 (8)		
> LLB-3		1.1,2 (8)	1.6,2 (8)	1.4,2 (8)	1.3,2 (8)	1.5,2 (8)	1.1,2 (8)	1.4,2 (8)	1.9,2 (8)	1.3,2 (8)	1.8,2 (8)
> LLB-4			1.5,2 (4)	1.3,2 (4)				1.3,2 (4)	1.8,2 (4)		1.3,2 (4)
> LLB-5			1.8,2 (4)	1.3,2 (4)	1.3,2 (4)			1.3,2 (4)	1.8,2 (4)	1.3,2 (4)	1.3,2 (4)

Table B-3b continued. Little Lake Butte des Morts project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**				**Mortality**			**Reproductive**				
	Bisphenol A	**Carbamazepine**	**Estrone**	**Triclosan**	**DEET**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Triclosan**	**Venlafaxine**
LLB-1	1.1,1.5 (4)		1.3,2 (4)		1.5,2 (4)			1.1,1.5 (4)	1.8,2 (4)	1.3,2 (4)		
LLB-2	1.1,1.5 (8)		1.4,2 (8)		1.4,2 (8)		1.1,2 (8)	1.1,1.5 (8)	1.5,2 (8)	1.4,2 (8)		1.1,2 (8)
> LLB-3	1.1,1.5 (8)	1.4,2 (8)	1.4,2 (8)	1.3,2 (8)	1.6,2 (8)	1.3,2 (8)	1.8,2 (8)	1.1,1.5 (8)	1.8,2 (8)	1.4,2 (8)	1.3,2 (8)	1.8,2 (8)
> LLB-4	1.1,1.5 (4)		1.3,2 (4)		1.5,2 (4)		1.3,2 (4)	1.1,1.5 (4)	1.8,2 (4)	1.3,2 (4)		1.3,2 (4)
> LLB-5	1.1,1.5 (4)		1.3,2 (4)	1.3,2 (4)	1.8,2 (4)	1.3,2 (4)	1.3,2 (4)	1.1,1.5 (4)	1.5,2 (4)	1.3,2 (4)	1.3,2 (4)	1.3,2 (4)

Table B-4a. Fox River/Green Bay project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**												**Circulatory/ Blood Constituents**	
	4-Androstene-3,17-dione	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**Sitosterol, beta-**
> **DPERE-9**	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	2,2 (3)
EASTR-10				1.7,2 (3)		1.7,2 (3)		1.3,2 (3)	1.3,2 (3)					1.7,2 (3)
> **FXR-1**				2,2 (1)								2,2 (1)		
> **FXR-13**				1.3,2 (4)							1.3,2 (4)	1.5,2 (4)	1.8,2 (4)	1.3,2 (4)
> **FXR-14**				2,2 (1)										
> **FXR-2**				2,2 (1)					2,2 (1)					2,2 (1)
> **FXR-3**				2,2 (1)					2,2 (1)					2,2 (1)
FXR-4				2,2 (1)										2,2 (1)
FXR-5				1.5,2 (2)					1.5,2 (2)					1.5,2 (2)
FXR-6				2,2 (1)										
> **GRBAY-12**		1.3,2 (3)	1.3,2 (3)	1.7,2 (3)		1.7,2 (3)							1.3,2 (3)	1.7,2 (3)
LBM-1						1.3,2 (3)								1.7,2 (3)
LKP-1														1.3,2 (3)
> **LLB-6**				1.4,2 (8)							1.1,2 (8)	1.3,2 (8)	1.6,2 (8)	1.4,2 (8)
PRGAM-11				2,2 (2)										2,2 (2)

Table B-4a continued. Fox River/Green Bay project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Genotoxicity**	**Histopathology**		**Neurological**	**Physiological/Metabolic**		
	DEET	**Venlafaxine**	**Ibuprofen**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
> DPERE-9	2.3,3 (3)	1.7,3 (3)	1.7,3 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)
EASTR-10	2,2 (3)		1.7,3 (3)					1.7,2 (3)	
> FXR-1	2,2 (1)	3,3 (1)			2,2 (1)				2,2 (1)
> FXR-13	1.8,2 (4)	1.5,2 (4)		1.8,2 (4)	1.5,2 (4)	1.8,2 (4)	1.8,2 (4)		1.8,2 (4)
> FXR-14	2,2 (1)								2,2 (1)
> FXR-2	2,2 (1)								
> FXR-3	2,2 (1)								
FXR-4	2,2 (1)								
FXR-5	2,2 (2)								
FXR-6	2,2 (1)								
> GRBAY-12	2,2 (3)			1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	1.3,2 (3)
LBM-1	1.3,2 (3)			1.3,2 (3)				1.3,2 (3)	
LKP-1				1.3,2 (3)					
> LLB-6	1.8,3 (8)	1.3,2 (8)		1.6,2 (8)	1.3,2 (8)	1.6,2 (8)	1.6,2 (8)		1.5,2 (8)
PRGAM-11	2.5,3 (2)								

Table B-4b. Fox River/Green Bay project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**								**Behavioral**						
	4-Androstene-3,17-dione	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**Ibuprofen**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
> DPERE-9	1.3,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	2,2 (3)		1.3,2 (3)
EASTR-10			2,2 (3)		1.7,2 (3)	1.3,2 (3)						1.7,2 (3)	1.7,2 (3)		
> FXR-1			2,2 (1)					2,2 (1)							2,2 (1)
> FXR-13			1.8,2 (4)				1.3,2 (4)	1.3,2 (4)					1.8,2 (4)	1.3,2 (4)	1.5,2 (4)
> FXR-14			2,2 (1)										2,2 (1)		
> FXR-2			2,2 (1)										2,2 (1)		
> FXR-3			2,2 (1)										2,2 (1)		
FXR-4			2,2 (1)										2,2 (1)		
FXR-5			2,2 (2)										2,2 (2)		
FXR-6			2,2 (1)												
> GRBAY-12		1.3,2 (3)	2,2 (3)		1.7,2 (3)				1.3,2 (3)	1.3,2 (3)		1.7,2 (3)	2,2 (3)		
LBM-1			1.3,2 (3)		1.3,2 (3)							1.3,2 (3)	2,2 (3)		
LKP-1													1.3,2 (3)		
> LLB-6			1.6,2 (8)				1.1,2 (8)	1.1,2 (8)					1.9,2 (8)	1.1,2 (8)	1.3,2 (8)
PRGAM-11			2,2 (2)										2,2 (2)		

Table B-4b continued. Fox River/Green Bay project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**					**Mortality**				**Reproductive**				
	Carbamazepine	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**DEET**	**Ibuprofen**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Triclosan**	**Venlafaxine**
> DPERE-9	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)		2,2 (3)	1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)		1.3,2 (3)
EASTR-10		1.7,2 (3)	1.3,2 (3)			2,2 (3)	1.3,2 (3)				1.7,2 (3)	1.3,2 (3)		
> FXR-1						2,2 (1)			2,2 (1)					2,2 (1)
> FXR-13					1.3,2 (4)	1.8,2 (4)		1.3,2 (4)	1.5,2 (4)	1.8,2 (4)			1.3,2 (4)	1.5,2 (4)
> FXR-14						2,2 (1)								
> FXR-2						2,2 (1)								
> FXR-3						2,2 (1)								
FXR-4						2,2 (1)								
FXR-5						2,2 (2)								
FXR-6						2,2 (1)								
> GRBAY-12	1.7,2 (3)				2,2 (3)					1.3,2 (3)	1.7,2 (3)			
LBM-1		1.3,2 (3)				1.3,2 (3)					1.3,2 (3)			
LKP-1										1.3,2 (3)				
> LLB-6					1.1,2 (8)	1.6,2 (8)		1.1,2 (8)	1.3,2 (8)	1.6,2 (8)			1.1,2 (8)	1.3,2 (8)
PRGAM-11					2,2 (2)									

Table B-5a. Kewaunee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Comprehensive SVs				Circulatory/Blood Constituents			Endocrine		Histopathology		Neurological	Physiological/ Metabolic		
	DEET	Estrone	Sitosterol, beta-	Venlafaxine	Carbamazepine	DEET	Sitosterol, beta-	DEET	Venlafaxine	Carbamazepine	Venlafaxine	Carbamazepine	Carbamazepine	Estrone	HHCB
KWE-1			1.3,2 (3)				1.3,2 (3)	1.3,2 (3)							
> KWE-2		1.3,2 (3)	1.3,2 (3)				1.3,2 (3)							1.3,2 (3)	
> KWE-3	1.2,2 (5)			1.2,2 (5)		1.2,2 (5)	1.4,2 (5)	1.4,3 (5)	1.2,2 (5)	1.4,2 (5)	1.2,2 (5)				1.4,2 (5)
KWE-4	1.3,2 (3)					1.3,2 (3)	1.3,2 (3)	2,3 (3)							1.3,2 (3)
> KWE-5		1.6,2 (5)	1.6,2 (5)	1.6,2 (5)	1.4,2 (5)		1.8,2 (5)	1.2,2 (5)	1.6,2 (5)	2,2 (5)	1.6,2 (5)	1.4,2 (5)	1.4,2 (5)	1.6,2 (5)	1.4,2 (5)

Table B-5b. Kewaunee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Population-relevant SVs				Behavioral			Developmental		Mortality		Reproductive			
	DEET	Estrone	Sitosterol, beta-	Venlafaxine	Estrone	Sitosterol, beta-	Venlafaxine	Bisphenol A	Estrone	DEET	Venlafaxine	Bisphenol A	Carbamazepine	Estrone	Venlafaxine
KWE-1	1.3,2 (3)					1.3,2 (3)		1.2,1.5 (3)		1.3,2 (3)		1.2,1.5 (3)			
> KWE-2		1.3,2 (3)			1.3,2 (3)	1.3,2 (3)		1.2,1.5 (3)	1.3,2 (3)			1.2,1.5 (3)		1.3,2 (3)	
> KWE-3	1.2,2 (5)			1.2,2 (5)		1.6,2 (5)	1.2,2 (5)	1.2,1.5 (5)		1.2,2 (5)	1.2,2 (5)	1.2,1.5 (5)	1.4,2 (5)		1.2,2 (5)
KWE-4	1.7,2 (3)					1.3,2 (3)		1.2,1.5 (3)		1.7,2 (3)		1.2,1.5 (3)			
> KWE-5	1.2,2 (5)	1.6,2 (5)	1.2,2 (5)		1.6,2 (5)	2,2 (5)	1.4,2 (5)	1.2,1.5 (5)	1.6,2 (5)	1.2,2 (5)	1.6,2 (5)	1.2,1.5 (5)	1.6,2 (5)	1.6,2 (5)	1.6,2 (5)

Table B-6a. Milwaukee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**									**Circulatory/Blood Constituents**		
	Carbamazepine	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**TBEP**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
> JISLA-15	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)			2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)
> KINNI-17			2,2 (2)				1.5,2 (2)				1.5,2 (2)	1.5,2 (2)
> MENMR-13			2,2 (2)								1.5,2 (2)	1.5,2 (2)
> MILWR-14			2,2 (2)		1.5,2 (2)			2,2 (2)			1.5,2 (2)	

Table B-6a continued. Milwaukee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Genotoxicity**	**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Ibuprofen**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
> JISLA-15	2.5,3 (2)	3,3 (2)		2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)
> KINNI-17	3,3 (2)		2,3 (2)						1.5,2 (2)
> MENMR-13	3,3 (2)								
> MILWR-14	3,3 (2)							1.5,2 (2)	

Table B-6b. Milwaukee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**					**Behavioral**						**Developmental**			
	Citalopram	**DEET**	**Estrone**	**Ibuprofen**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**TBEP**
> JISLA-15	2,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)		
> KINNI-17		2,2 (2)		1.5,2 (2)						2,2 (2)				2,3 (2)	
> MENMR-13		2,2 (2)								2,2 (2)					
> MILWR-14		2,2 (2)	1.5,2 (2)						1.5,2 (2)	2,2 (2)			1.5,2 (2)		1.5,2 (2)

Table B-6b continued. Milwaukee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mortality**			**Reproductive**			
	DEET	**Ibuprofen**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Venlafaxine**
> JISLA-15	2,2 (2)		2,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)
> KINNI-17	2,2 (2)	1.5,2 (2)				2,3 (2)	
> MENMR-13	2,2 (2)						
> MILWR-14	2,2 (2)				1.5,2 (2)		

Table B-7a. North Shore Channel project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Comprehensive SVs												Circulatory/Blood Constituents		
	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine	Carbamazepine	DEET	Sitosterol, beta-
> CHI-112	1.3,2 (3)	1.2,1.5 (3)	1.7,2 (3)		1.7,2 (3)		**2.7,3 (3)**	1.7,2 (3)	1.3,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)		1.7,2 (3)
> CHI-36	1.7,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)	2,2 (3)	**2,3 (3)**	2,2 (3)	1.3,2 (3)	2,2 (3)	1.7,2 (3)	**2.3,3 (3)**	2,2 (3)	1.7,2 (3)	2,2 (3)
> CHI-RP4	2,2 (6)	1.2,1.5 (6)	2,2 (6)	1.3,2 (6)	2,2 (6)	1.8,2 (6)	**2,3 (6)**	2,2 (6)	1.5,2 (6)	1.8,2 (6)	1.8,2 (6)	2,2 (6)	2,2 (6)	1.7,2 (6)	1.7,2 (6)

Table B-7a continued. North Shore Channel project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Endocrine		Gross Pathology	Histopathology		Neurological	Physiological/ Metabolic		
	DEET	Venlafaxine	Bisphenol A	Carbamazepine	Venlafaxine	Carbamazepine	Carbamazepine	Estrone	HHCB
> CHI-112	**2,2 (3)**	1.7,2 (3)		1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	**2.7,3 (3)**	2,2 (3)
> CHI-36	**3,3 (3)**	**3,3 (3)**		**2.7,3 (3)**	**2.3,3 (3)**	2,2 (3)	2,2 (3)	**2.3,3 (3)**	2,2 (3)
> CHI-RP4	**2.8,3 (6)**	**3,3 (6)**	1.1,1.5 (6)	**2.2,3 (6)**	2,2 (6)	2,2 (6)	2,2 (6)	**2.7,3 (6)**	2,2 (6)

Table B-7b. North Shore Channel project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Population-relevant SVs												Behavioral							
	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Sitosterol, beta-	TBEP	Triclosan	Venlafaxine	Carbamazepine	Citalopram	Diphenhydramine	Estrone	HHCB	Sitosterol, beta-	Triclosan	Venlafaxine
> CHI-112	1.3,2 (3)				2,2 (3)		2,2 (3)		1.3,2 (3)		1.7,2 (3)	1.7,2 (3)	1.3,2 (3)			2,2 (3)		1.7,2 (3)	1.7,2 (3)	1.7,2 (3)
> CHI-36	1.7,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)		1.7,2 (3)	1.7,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)	2,2 (3)	1.7,2 (3)	2,2 (3)
> CHI-RP4	1.8,2 (6)	1.2,1.5 (6)	2,2 (6)	1.3,2 (6)	2,2 (6)	1.7,2 (6)	1.8,2 (6)	1.8,2 (6)		1.3,2 (6)	1.8,2 (6)	2,2 (6)	2,2 (6)	1.3,2 (6)	1.7,2 (6)	1.8,2 (6)	2,2 (6)	1.7,2 (6)	1.8,2 (6)	2,2 (6)

Table B-7b continued. North Shore Channel project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Developmental							Growth		Mortality					Reproductive				
	Bisphenol A	Carbamazepine	Diphenhydramine	Estrone	HHCB	TBEP	Triclosan	Bisphenol A	HHCB	DEET	HHCB	TBEP	Triclosan	Venlafaxine	Bisphenol A	Carbamazepine	Estrone	Triclosan	Venlafaxine
> CHI-112	1.2,1.5 (3)	1.7,2 (3)		2,2 (3)		1.7,2 (3)	1.7,2 (3)			2,2 (3)			1.7,2 (3)	1.7,2 (3)	1.2,1.5 (3)	1.7,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)
> CHI-36	1.2,1.5 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)		1.7,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	**3,3 (3)**	1.2,1.5 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)
> CHI-RP4	1.2,1.5 (6)	2,2 (6)	1.3,2 (6)	1.8,2 (6)	1.8,2 (6)	1.7,2 (6)	1.8,2 (6)	1.2,1.5 (6)	1.7,2 (6)	2,2 (6)	1.7,2 (6)	1.3,2 (6)	1.8,2 (6)	**2.8,3 (6)**	1.2,1.5 (6)	2,2 (6)	1.8,2 (6)	1.8,2 (6)	2,2 (6)

Table B-8a. Little Calumet River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**												**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
> CHI-56		1.2,1.5 (3)			1.7,2 (3)		1.3,2 (3)	1.7,2 (3)				1.7,2 (3)	1.7,2 (3)		1.7,2 (3)
> CHI-76	1.7,2 (3)	1.8,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)	2,2 (3)	**2.3,3 (3)**	2,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)
> CHI-RP7	1.7,2 (6)	1.8,2 (6)	2,2 (6)	1.3,2 (6)	2,2 (6)	2,2 (6)	1.7,2 (6)	2,2 (6)	1.5,2 (6)	1.3,2 (6)	1.8,2 (6)	2,2 (6)	2,2 (6)	1.3,2 (6)	1.8,2 (6)

Table B-8a continued. Little Calumet River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Gross Pathology**	**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
> CHI-56	2,2 (3)	1.7,2 (3)		2,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.3,2 (3)	2,2 (3)
> CHI-76	**3,3 (3)**	**3,3 (3)**	1.5,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	**2.3,3 (3)**	2,2 (3)
> CHI-RP7	**2.7,3 (6)**	**3,3 (6)**	1.4,2 (6)	2,2 (6)	2,2 (6)	2,2 (6)	2,2 (6)	**2.3,3 (6)**	2,2 (6)

Table B-8b. Little Calumet River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Mean Population-relevant SVs										Behavioral							
	4-Androstene-3,17-dione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Triclosan	Venlafaxine	Carbamazepine	Citalopram	Diphenhydramine	Estrone	HHCB	Sitosterol, beta-	Triclosan	Venlafaxine
> CHI-56		1.2,1.5 (3)			2,2 (3)		1.3,2 (3)			1.7,2 (3)				1.3,2 (3)		1.7,2 (3)		1.7,2 (3)
> CHI-76	1.7,2 (3)	1.8,2 (3)	1.7,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)	1.3,2 (3)	1.7,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)
> CHI-RP7	1.3,2 (6)	1.8,2 (6)	1.3,2 (6)	1.3,2 (6)	2,2 (6)	1.7,2 (6)	1.7,2 (6)		1.8,2 (6)	2,2 (6)	2,2 (6)	1.3,2 (6)	1.7,2 (6)	1.7,2 (6)	1.7,2 (6)	1.8,2 (6)	1.8,2 (6)	2,2 (6)

Table B-8b continued. Little Calumet River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	Developmental						Growth	Mortality			Reproductive				
	Bisphenol A	Carbamazepine	Estrone	HHCB	TBEP	Triclosan	Bisphenol A	DEET	Triclosan	Venlafaxine	Bisphenol A	Carbamazepine	Estrone	Triclosan	Venlafaxine
> CHI-56	1.2,1.5 (3)	1.3,2 (3)	1.3,2 (3)					2,2 (3)		1.7,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)		1.7,2 (3)
> CHI-76	1.8,2 (3)	2,2 (3)	1.7,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	1.8,2 (3)	2,2 (3)	1.7,2 (3)	2,2 (3)	1.8,2 (3)	2,2 (3)	1.7,2 (3)	1.7,2 (3)	2,2 (3)
> CHI-RP7	1.8,2 (6)	2,2 (6)	1.7,2 (6)	1.2,2 (6)	1.2,2 (6)	1.8,2 (6)	1.7,2 (6)	2,2 (6)	1.8,2 (6)	**2.2,3 (6)**	1.8,2 (6)	2,2 (6)	1.7,2 (6)	1.8,2 (6)	2,2 (6)

Table B-9a. Grand River/Maple River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**								**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**Carbamazepine**	**Citalopram**	**DEET**	**Estrone**	**Sitosterol, beta-**	**TBEP**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
GRAND-3		1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)
GRAND-4		1.5,2 (2)	1.5,2 (2)	2,2 (2)				1.5,2 (2)	2,2 (2)		
GRAND-5		1.3,2 (3)	1.7,2 (3)	1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	1.7,2 (3)	1.3,2 (3)	1.7,2 (3)
> GRAND-6	1.3,2 (3)	1.3,2 (3)	2,2 (3)	1.7,2 (3)			1.3,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)
MAPLE-1				1.7,2 (3)	1.3,2 (3)				1.3,2 (3)		1.3,2 (3)
> MAPLE-2				1.7,2 (3)	1.3,2 (3)	1.7,2 (3)					1.7,2 (3)

Table B-9a continued. Grand River/Maple River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
GRAND-3	**2.3,3 (3)**	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)
GRAND-4	2,2 (2)	1.5,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		
GRAND-5	**2,3 (3)**	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)	1.7,2 (3)		1.7,2 (3)
> GRAND-6	**2.3,3 (3)**	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)		1.7,2 (3)
MAPLE-1	2,2 (3)		1.3,2 (3)		1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)
> MAPLE-2	**2.3,3 (3)**		1.3,2 (3)				1.3,2 (3)	

Table B-9b. Grand River/Maple River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**					**Behavioral**				
	Citalopram	**DEET**	**Estrone**	**Sitosterol, beta-**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Estrone**	**Sitosterol, beta-**	**Venlafaxine**
GRAND-3	1.7,2 (3)	2,2 (3)	1.3,2 (3)		2,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	2,2 (3)
GRAND-4	1.5,2 (2)	2,2 (2)			1.5,2 (2)		1.5,2 (2)			1.5,2 (2)
GRAND-5	1.7,2 (3)	1.7,2 (3)			1.7,2 (3)		1.3,2 (3)		1.7,2 (3)	1.7,2 (3)
> GRAND-6	2,2 (3)	2,2 (3)			2,2 (3)		1.7,2 (3)		1.7,2 (3)	2,2 (3)
MAPLE-1		2,2 (3)	1.3,2 (3)					1.3,2 (3)	1.7,2 (3)	
> MAPLE-2		2,2 (3)	1.3,2 (3)	1.3,2 (3)				1.3,2 (3)	1.7,2 (3)	

Table B-9b continued. Grand River/Maple River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**			**Mortality**		**Reproductive**			
	Bisphenol A	**Carbamazepine**	**Estrone**	**DEET**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Venlafaxine**
GRAND-3	1.2,1.5 (3)	1.7,2 (3)	1.3,2 (3)	2,2 (3)	2,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)
GRAND-4		1.5,2 (2)		2,2 (2)	1.5,2 (2)		2,2 (2)		1.5,2 (2)
GRAND-5	1.2,1.5 (3)	1.3,2 (3)		1.7,2 (3)	1.7,2 (3)	1.2,1.5 (3)	1.7,2 (3)		1.7,2 (3)
> **GRAND-6**	1.2,1.5 (3)	1.7,2 (3)		2,2 (3)	2,2 (3)	1.2,1.5 (3)	2,2 (3)		2,2 (3)
MAPLE-1	1.2,1.5 (3)		1.3,2 (3)	2,2 (3)		1.2,1.5 (3)	1.3,2 (3)	1.3,2 (3)	
> **MAPLE-2**	1.2,1.5 (3)		1.3,2 (3)	2,2 (3)		1.2,1.5 (3)		1.3,2 (3)	

Table B-10a. Saginaw River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**								**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**Carbamazepine**	**Citalopram**	**DEET**	**Estrone**	**HHCB**	**TBEP**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
SGNR-1				1.5,2 (2)							1.5,2 (2)
> SGNR-10		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	2,2 (2)	2,2 (2)		
> SGNR-11		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	2,2 (2)	1.5,2 (2)		2,2 (2)
> SGNR-12		1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		1.5,2 (2)
SGNR-13				1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	2,2 (2)	2,2 (2)		1.5,2 (2)
SGNR-14											
> SGNR-2		1.5,2 (2)		1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		1.5,2 (2)
SGNR-3		1.5,2 (2)		1.5,2 (2)	1.5,2 (2)			2,2 (2)	2,2 (2)		1.5,2 (2)
SGNR-4				1.5,2 (2)					1.5,2 (2)	1.5,2 (2)	
> SGNR-5				1.5,2 (2)	1.5,2 (2)						1.5,2 (2)
SGNR-6				1.5,2 (2)							
SGNR-7								2,2 (2)	1.5,2 (2)		1.5,2 (2)
SGNR-8	1.5,2 (2)				1.5,2 (2)			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
> SGNR-9	1.5,2 (2)				1.5,2 (2)			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)

Table B-10a continued. Saginaw River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
SGNR-1	**2.5,3 (2)**							
> **SGNR-10**	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)
> **SGNR-11**	**2.5,3 (2)**	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)
> **SGNR-12**	**2.5,3 (2)**	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-13	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	
SGNR-14								
> **SGNR-2**	**2.5,3 (2)**	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)		1.5,2 (2)
SGNR-3	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	
SGNR-4	**2.5,3 (2)**		1.5,2 (2)		1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
> **SGNR-5**	2,2 (2)		1.5,2 (2)				1.5,2 (2)	
SGNR-6	1.5,2 (2)							
SGNR-7	1.5,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)		
SGNR-8		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	
> **SGNR-9**		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)

Table B-10b. Saginaw River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**				**Behavioral**			
	Citalopram	**DEET**	**Estrone**	**Venlafaxine**	**Citalopram**	**Estrone**	**Sitosterol, beta-**	**Venlafaxine**
SGNR-1		2,2 (2)					2,2 (2)	
> **SGNR-10**	1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	2,2 (2)
> **SGNR-11**	1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)
> **SGNR-12**	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-13		2,2 (2)	1.5,2 (2)	2,2 (2)		1.5,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-14							1.5,2 (2)	
> **SGNR-2**		2,2 (2)		1.5,2 (2)			1.5,2 (2)	2,2 (2)
SGNR-3		2,2 (2)	1.5,2 (2)	2,2 (2)		1.5,2 (2)	2,2 (2)	2,2 (2)
SGNR-4		2,2 (2)					1.5,2 (2)	
> **SGNR-5**		2,2 (2)	1.5,2 (2)			1.5,2 (2)	1.5,2 (2)	
SGNR-6		2,2 (2)					2,2 (2)	
SGNR-7		1.5,2 (2)		1.5,2 (2)			1.5,2 (2)	1.5,2 (2)
SGNR-8		1.5,2 (2)				1.5,2 (2)	1.5,2 (2)	1.5,2 (2)
> **SGNR-9**			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)

Table B-10b continued. Saginaw River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**			**Mortality**		**Reproductive**			
	Bisphenol A	**Carbamazepine**	**Estrone**	**DEET**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Venlafaxine**
SGNR-1				2,2 (2)					
> SGNR-10		1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)
> SGNR-11		1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)
> SGNR-12		1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-13			1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-14	1.3,1.5 (2)					1.3,1.5 (2)			
> SGNR-2		1.5,2 (2)		2,2 (2)	2,2 (2)		2,2 (2)		2,2 (2)
SGNR-3		1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)
SGNR-4	1.3,1.5 (2)			2,2 (2)		1.3,1.5 (2)	1.5,2 (2)		
> SGNR-5			1.5,2 (2)	2,2 (2)			1.5,2 (2)	1.5,2 (2)	
SGNR-6				1.5,2 (2)					
SGNR-7				1.5,2 (2)	2,2 (2)		1.5,2 (2)		2,2 (2)
SGNR-8			1.5,2 (2)		1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)
> SGNR-9			1.5,2 (2)		1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)

Table B-11a. St. Clair River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**		**Endocrine**	**Physiological/ Metabolic**
	4-Androstene-3,17-dione	**Estrone**	**DEET**	**Estrone**
> SCR-1			1.5,2 (2)	
> SCR-3	1.5,2 (2)		1.5,2 (2)	
> SCR-4	2,2 (1)			
> SCR-5	1.5,2 (2)			
SCR-7	2,2 (1)			
SCR-8		2,2 (1)	2,2 (1)	2,2 (1)

Table B-11b. St. Clair River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**		**Behavioral**		**Developmental**	**Mortality**	**Reproductive**
	DEET	**Estrone**	**Estrone**	**Sitosterol, beta-**	**Estrone**	**DEET**	**Estrone**
> SCR-1	1.5,2 (2)			1.5,2 (2)		1.5,2 (2)	
> SCR-3	1.5,2 (2)					1.5,2 (2)	
SCR-8	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)

Table B-12a. Clinton River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**					**Circulatory/Blood Constituents**		
	Carbamazepine	**DEET**	**Estrone**	**HHCB**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
> CLI-1-DOWN	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)
CLI-2-CAPT	2,2 (2)	2,2 (2)		1.5,2 (2)	1.5,2 (2)	2,2 (2)	1.5,2 (2)	
> CLI-3-WWTP	1.5,2 (2)	2,2 (2)		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)		
CLI-4-STONY		1.5,2 (2)	2,2 (2)					1.5,2 (2)
CLI-5-CASS		2,2 (2)						

Table B-12a continued. Clinton River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
> CLI-1-DOWN	**2.5,3 (2)**	1.5,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)
CLI-2-CAPT	**2.5,3 (2)**	1.5,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)
> CLI-3-WWTP	2,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
CLI-4-STONY	2,2 (2)						2,2 (2)	
CLI-5-CASS	2,2 (2)							

Table B-12b. Clinton River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**			**Behavioral**				**Developmental**		**Mortality**		**Reproductive**		
	DEET	**Estrone**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**Sitosterol, beta-**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**DEET**	**Venlafaxine**	**Carbamazepine**	**Estrone**	**Venlafaxine**
> CLI-1-DOWN	2,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)
CLI-2-CAPT	2,2 (2)		1.5,2 (2)	1.5,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)		1.5,2 (2)
> CLI-3-WWTP	2,2 (2)		1.5,2 (2)	1.5,2 (2)		1.5,2 (2)	1.5,2 (2)	1.5,2 (2)		2,2 (2)	1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
CLI-4-STONY	2,2 (2)	2,2 (2)			2,2 (2)	1.5,2 (2)			2,2 (2)	2,2 (2)			2,2 (2)	
CLI-5-CASS	2,2 (2)					1.5,2 (2)				2,2 (2)				

Table B-13a. Detroit River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**										**Circulatory/ Blood Constituents**	
	4-Androstene-3,17-dione	**Carbam-azepine**	**DEET**	**Diphen-hydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Carbam-azepine**	**Sitosterol, beta-**
> **DTR-1**			1.5,2 (2)									
> **DTR-2**					1.5,2 (2)					1.5,2 (2)		
DTR-3												
> **DTR-4**	2,2 (1)				2,2 (1)							
DTR-5												
DTR-6												
GROSIL-3	1.5,2 (2)		1.5,2 (2)									
PTHENN-1			1.5,2 (2)		1.5,2 (2)					1.5,2 (2)		
TRENTN-4		1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)
WYAND-2	1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	1.5,2 (2)

Table B-13a continued. Detroit River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Genotoxicity**	**Histopathology**	**Neurological**	**Physiological/ Metabolic**			
	DEET	**Ibuprofen**	**Ibuprofen**	**Carbamazepine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**	**Ibuprofen**
> DTR-1	1.5,2 (2)								
> DTR-2	1.5,2 (2)						1.5,2 (2)	2,2 (2)	
DTR-3								1.5,2 (2)	
> DTR-4							2,2 (1)	2,2 (1)	
DTR-5								2,2 (1)	
DTR-6								2,2 (1)	
GROSIL-3	2,2 (2)							1.5,2 (2)	
PTHENN-1	2,2 (2)						1.5,2 (2)		
TRENTN-4	2,2 (2)	1.5,2 (2)	**3,3 (2)**	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)
WYAND-2	2,2 (2)		**3,3 (2)**	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	**3,3 (2)**	2,2 (2)	

Table B-13b. Detroit River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**						**Behavioral**		
	4-Androstene-3,17-dione	**DEET**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Estrone**	**Sitosterol, beta-**	**Triclosan**
DTR-1		1.5,2 (2)							
DTR-2		1.5,2 (2)	1.5,2 (2)			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
DTR-4			2,2 (1)				2,2 (1)		
GROSIL-3		2,2 (2)							
PTHENN-1		2,2 (2)	1.5,2 (2)			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)
TRENTN-4		2,2 (2)	2,2 (2)	2,2 (2)		2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)
WYAND-2	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)

Table B-13b continued. Detroit River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**					**Mortality**			**Reproductive**			
	Carbamazepine	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**DEET**	**Ibuprofen**	**Triclosan**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Triclosan**
DTR-1						1.5,2 (2)						
DTR-2		1.5,2 (2)			1.5,2 (2)	1.5,2 (2)		1.5,2 (2)		1.5,2 (2)		1.5,2 (2)
DTR-4		2,2 (1)								2,2 (1)		
GROSIL-3						2,2 (2)						
PTHENN-1		1.5,2 (2)			1.5,2 (2)	2,2 (2)		1.5,2 (2)		1.5,2 (2)		1.5,2 (2)
TRENTN-4	1.5,2 (2)	2,2 (2)	**3,3 (2)**	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	**3,3 (2)**	2,2 (2)
WYAND-2	1.5,2 (2)	2,2 (2)	**3,3 (2)**	1.5,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)	**3,3 (2)**	2,2 (2)

Table B-14a. River Raisin project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**	**Endocrine**	**Physiological/ Metabolic**	
	Estrone	**DEET**	**Estrone**	**HHCB**
RRR-1		2,2 (1)		2,2 (1)
RRR-2		2,2 (1)		2,2 (1)
> RRR-3		2,2 (1)		2,2 (1)
> RRR-4	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)

Table B-14b. River Raisin project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**		**Behavioral**	**Developmental**	**Mortality**	**Reproductive**
	DEET	**Estrone**	**Estrone**	**Estrone**	**DEET**	**Estrone**
RRR-1	2,2 (1)				2,2 (1)	
RRR-2	2,2 (1)				2,2 (1)	
> RRR-3	2,2 (1)				2,2 (1)	
> RRR-4	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)

Table B-15a. Swan Creek project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**				**Circulatory/Blood Constituents**		**Endocrine**		**Genotoxicity**	**Physiological/ Metabolic**		
	DEET	**Estrone**	**Ibuprofen**	**TBEP**	**Ibuprofen**	**Sitosterol, beta-**	**DEET**	**Ibuprofen**	**Ibuprofen**	**Estrone**	**HHCB**	**Ibuprofen**
> SWC-1	2,2 (1)	2,2 (1)					2,2 (1)			2,2 (1)		
> SWC-10	2,2 (2)	2,2 (2)					2,2 (2)			2,2 (2)		
> SWC-11	1.5,2 (2)	2,2 (2)	2,2 (1)			1.5,2 (2)	2,2 (2)		**3,3 (1)**	2,2 (2)		
> SWC-12	2,2 (1)			2,2 (1)			2,2 (1)					
> SWC-2	2,2 (1)						2,2 (1)					
> SWC-3	2,2 (1)						2,2 (1)					
> SWC-4	2,2 (1)	2,2 (1)					2,2 (1)			2,2 (1)		
> SWC-5	2,2 (1)						2,2 (1)				2,2 (1)	
> SWC-6		2,2 (1)					2,2 (1)			2,2 (1)		
> SWC-7	1.5,2 (2)		2,2 (1)			1.5,2 (2)	2,2 (2)		**3,3 (1)**		1.5,2 (2)	
> SWC-8	1.5,2 (2)		**3,3 (1)**		2,2 (1)		2,2 (2)	2,2 (1)	**3,3 (1)**			2,2 (1)
> SWC-9	2,2 (3)	1.3,2 (3)					2,2 (3)			1.3,2 (3)	1.3,2 (3)	
> SWC-CP-8	2,2 (1)						2,2 (1)					

Table B-15b. Swan Creek project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**			**Behavioral**		**Developmental**		**Mortality**		**Reproductive**	
	DEET	**Estrone**	**Ibuprofen**	**Estrone**	**Sitosterol, beta-**	**Estrone**	**Ibuprofen**	**DEET**	**Ibuprofen**	**Estrone**	**Ibuprofen**
> SWC-1	2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)	
> SWC-10	2,2 (2)	2,2 (2)		2,2 (2)	1.5,2 (2)	2,2 (2)		2,2 (2)		2,2 (2)	
> SWC-11	2,2 (2)	2,2 (2)	2,2 (1)	2,2 (2)	1.5,2 (2)	2,2 (2)	2,2 (1)	2,2 (2)	2,2 (1)	2,2 (2)	2,2 (1)
> SWC-12	2,2 (1)							2,2 (1)			
> SWC-2	2,2 (1)							2,2 (1)			
> SWC-3	2,2 (1)							2,2 (1)			
> SWC-4	2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)	
> SWC-5	2,2 (1)							2,2 (1)			
> SWC-6	2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)	
> SWC-7	2,2 (2)		2,2 (1)		1.5,2 (2)		2,2 (1)	2,2 (2)	2,2 (1)		2,2 (1)
> SWC-8	2,2 (2)		**3,3 (1)**		1.5,2 (2)		**3,3 (1)**	2,2 (2)	2,2 (1)		**3,3 (1)**
> SWC-9	2,2 (3)	1.3,2 (3)		1.3,2 (3)		1.3,2 (3)		2,2 (3)		1.3,2 (3)	
> SWC-CP-8	2,2 (1)				2,2 (1)			2,2 (1)			

Table B-16a. Maumee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**													**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
CLARKO-6	1.5,2 (2)						1.5,2 (2)									
> MAU-BVP			2,2 (1)		2,2 (1)	2,2 (1)					2,2 (1)			2,2 (1)		
> MAU-CSO-68			2,2 (1)		2,2 (1)									2,2 (1)		
> MAU-CSO-9			2,2 (2)		2,2 (2)									2,2 (2)	1.5,2 (2)	
> MAU-Distal-DS-WWTP			2,2 (5)	1.8,2 (5)	1.6,2 (5)	1.8,2 (5)		1.6,2 (5)					2,2 (5)	2,2 (5)	1.2,2 (5)	1.2,2 (5)
> MAU-DS-CSO-9			2,2 (1)		2,2 (1)									2,2 (1)		
> MAU-DS-PB-WWTP			2,2 (2)	2,2 (2)	1.5,2 (2)								2,2 (2)	2,2 (2)	1.5,2 (2)	2,2 (2)
> MAU-DS-WWTP			2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)			2,2 (1)	2,2 (1)		2,2 (1)		
> MAU-GR-1																
> MAU-LASALLE			2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)			2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		
> MAU-N-EW-PB-WWTP			2,2 (1)	2,2 (1)		2,2 (1)							2,2 (1)	2,2 (1)		
MAU-PB-WWTP			2,2 (1)		2,2 (1)								2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)
> MAU-TOL-WWTP			2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)				2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)
MAU-US-CSO-9			2,2 (1)		2,2 (1)									2,2 (1)		
MAU-US-WWTP			2,2 (5)		1.6,2 (5)								1.6,2 (5)	2,2 (5)	1.2,2 (5)	
> MAU-WAT-1																2,2 (1)
> MAU-WAT-2																
> MX-WWTP	1.2,2 (5)	1.2,2 (5)	2,2 (5)	2,2 (5)	1.6,2 (5)	2,2 (5)	**1.4,3 (5)**	1.6,2 (5)	1.2,2 (5)	1.2,2 (5)			**2,3 (5)**	2,2 (5)	1.2,2 (5)	1.2,2 (5)
> SWANC-5			1.2,2 (5)		1.8,2 (5)		1.2,2 (5)					1.2,2 (5)		1.2,2 (5)	1.2,2 (5)	
> TOLEDO-7		1.2,1.5 (3)	2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)	2,2 (3)		2,2 (3)	1.7,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	

Table B-16a continued. Maumee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**			**Genotoxicity**	**Histopathology**		**Neurological**	**Physiological/ Metabolic**			
	DEET	**Ibuprofen**	**Venlafaxine**	**Ibuprofen**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**	**Ibuprofen**
CLARKO-6	2,2 (2)								1.5,2 (2)		
> MAU-BVP	2,2 (1)				2,2 (1)		2,2 (1)	2,2 (1)		2,2 (1)	
> MAU-CSO-68	2,2 (1)				2,2 (1)		2,2 (1)	2,2 (1)			
> MAU-CSO-9	**2.5,3 (2)**				2,2 (2)		2,2 (2)	2,2 (2)			
> MAU-Distal-DS-WWTP	**1.8,3 (5)**		**2.8,3 (5)**		2,2 (5)	2,2 (5)	2,2 (5)	2,2 (5)		1.8,2 (5)	
> MAU-DS-CSO-9	2,2 (1)				2,2 (1)		2,2 (1)	2,2 (1)			
> MAU-DS-PB-WWTP	**2,3 (2)**		**3,3 (2)**		2,2 (2)	2,2 (2)	2,2 (2)	2,2 (2)		1.5,2 (2)	
> MAU-DS-WWTP	2,2 (1)				2,2 (1)		2,2 (1)	2,2 (1)		2,2 (1)	
> MAU-GR-1	2,2 (1)										
> MAU-LASALLE	**3,3 (1)**		**3,3 (1)**		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	
> MAU-N-EW-PB-WWTP			2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	
MAU-PB-WWTP	**3,3 (1)**		2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)			
> MAU-TOL-WWTP	2,2 (1)		2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	
MAU-US-CSO-9	2,2 (1)				2,2 (1)		2,2 (1)	2,2 (1)			
MAU-US-WWTP	**1.8,3 (5)**		1.6,2 (5)		2,2 (5)	1.6,2 (5)	2,2 (5)	2,2 (5)			
> MAU-WAT-1	2,2 (1)										
> MAU-WAT-2	2,2 (1)										
> MX-WWTP	**2,3 (5)**		**2.4,3 (5)**	**1.4,3 (5)**	2,2 (5)	1.8,2 (5)	2,2 (5)	2,2 (5)	**1.4,3 (5)**	1.8,2 (5)	
> SWANC-5	**2,3 (5)**				1.2,2 (5)		1.2,2 (5)	1.2,2 (5)	1.2,2 (5)		
> TOLEDO-7	**2.7,3 (3)**	1.3,2 (3)	**1.7,3 (3)**	**3,3 (3)**	2,2 (3)	1.3,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)	1.3,2 (3)

Table B-16b. Maumee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**											**Behavioral**						
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
CLARKO-6					2,2 (2)		1.5,2 (2)								1.5,2 (2)			
> MAU-BVP					2,2 (1)							2,2 (1)				2,2 (1)		
> MAU-CSO-68					2,2 (1)							2,2 (1)						
> MAU-CSO-9					2,2 (2)							1.5,2 (2)						
> MAU-Distal-DS-WWTP				1.8,2 (5)	1.6,2 (5)	1.2,2 (5)					2,2 (5)	2,2 (5)	1.8,2 (5)	1.6,2 (5)		1.6,2 (5)		2,2 (5)
> MAU-DS-CSO-9					2,2 (1)							2,2 (1)						
> MAU-DS-PB-WWTP				2,2 (2)	1.5,2 (2)						2,2 (2)	1.5,2 (2)	2,2 (2)			2,2 (2)		2,2 (2)
> MAU-DS-WWTP				2,2 (1)	2,2 (1)					2,2 (1)		2,2 (1)	2,2 (1)				2,2 (1)	
> MAU-GR-1					2,2 (1)											2,2 (1)		
> MAU-LASALLE			2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)				2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)
> MAU-N-EW-PB-WWTP				2,2 (1)							2,2 (1)	2,2 (1)	2,2 (1)			2,2 (1)		2,2 (1)
MAU-PB-WWTP					2,2 (1)						2,2 (1)	2,2 (1)				2,2 (1)		2,2 (1)
> MAU-TOL-WWTP				2,2 (1)	2,2 (1)					2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)			2,2 (1)	2,2 (1)	2,2 (1)
MAU-US-CSO-9					2,2 (1)							2,2 (1)						
MAU-US-WWTP					1.6,2 (5)						1.6,2 (5)	2,2 (5)				1.2,2 (5)		1.6,2 (5)
> MAU-WAT-1					2,2 (1)											2,2 (1)		
> MAU-WAT-2					2,2 (1)											2,2 (1)		
> MX-WWTP	1.2,2 (5)	1.2,2 (5)	1.4,2 (5)	2,2 (5)	1.6,2 (5)	1.8,2 (5)	1.2,2 (5)	1.2,2 (5)			1.8,2 (5)	2,2 (5)	2,2 (5)	1.8,2 (5)	1.2,2 (5)	1.2,2 (5)		1.8,2 (5)
> SWANC-5					1.8,2 (5)		1.2,2 (5)			1.2,2 (5)		1.2,2 (5)			1.2,2 (5)		1.2,2 (5)	
> TOLEDO-7				2,2 (3)	2,2 (3)		1.3,2 (3)	2,2 (3)	1.3,2 (3)	1.7,2 (3)	1.3,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)	1.3,2 (3)

Table B-16b continued. Maumee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**						**Growth**	**Mortality**				**Reproductive**					
	Bisphenol A	**Carbamazepine**	**Estrone**	**Ibuprofen**	**TBEP**	**Triclosan**	**Bisphenol A**	**DEET**	**Ibuprofen**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Triclosan**	**Venlafaxine**
CLARKO-6			1.5,2 (2)					2,2 (2)						1.5,2 (2)			
> MAU-BVP		2,2 (1)						2,2 (1)					2,2 (1)				
> MAU-CSO-68		2,2 (1)						2,2 (1)					2,2 (1)				
> MAU-CSO-9		2,2 (2)						2,2 (2)					2,2 (2)				
> MAU-Distal-DS-WWTP		2,2 (5)						1.6,2 (5)			**2.2,3 (5)**		2,2 (5)				2,2 (5)
> MAU-DS-CSO-9		2,2 (1)						2,2 (1)					2,2 (1)				
> MAU-DS-PB-WWTP		2,2 (2)						1.5,2 (2)			2,2 (2)		2,2 (2)				2,2 (2)
> MAU-DS-WWTP		2,2 (1)				2,2 (1)		2,2 (1)		2,2 (1)			2,2 (1)			2,2 (1)	
> MAU-GR-1								2,2 (1)									
> MAU-LASALLE		2,2 (1)				2,2 (1)		2,2 (1)		2,2 (1)	**3,3 (1)**		2,2 (1)			2,2 (1)	2,2 (1)
> MAU-N-EW-PB-WWTP		2,2 (1)									2,2 (1)		2,2 (1)				2,2 (1)
MAU-PB-WWTP		2,2 (1)						2,2 (1)			2,2 (1)		2,2 (1)				2,2 (1)
> MAU-TOL-WWTP		2,2 (1)				2,2 (1)		2,2 (1)		2,2 (1)	2,2 (1)		2,2 (1)			2,2 (1)	2,2 (1)
MAU-US-CSO-9		2,2 (1)						2,2 (1)					2,2 (1)				
MAU-US-WWTP		2,2 (5)						1.6,2 (5)			1.6,2 (5)		2,2 (5)				1.6,2 (5)
> MAU-WAT-1								2,2 (1)									
> MAU-WAT-2								2,2 (1)									
> MX-WWTP	1.2,2 (5)	2,2 (5)	1.2,2 (5)	1.2,2 (5)			1.2,2 (5)	1.6,2 (5)	1.2,2 (5)		**2.4,3 (5)**	1.2,2 (5)	2,2 (5)	1.2,2 (5)	1.2,2 (5)		1.8,2 (5)
> SWANC-5		1.2,2 (5)	1.2,2 (5)			1.2,2 (5)		1.8,2 (5)		1.2,2 (5)			1.2,2 (5)	1.2,2 (5)		1.2,2 (5)	
> TOLEDO-7	1.3,2 (3)	2,2 (3)	1.3,2 (3)	**3,3 (3)**	1.7,2 (3)	1.7,2 (3)		2,2 (3)	2,2 (3)	1.7,2 (3)	1.3,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)	**3,3 (3)**	1.7,2 (3)	1.3,2 (3)

Table B-17a. Cuyahoga River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**											
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**
CUY-1-ROCK			1.8,2 (5)	1.2,2 (5)	1.8,2 (5)		1.6,2 (5)	1.6,2 (5)	1.2,2 (5)	1.6,2 (5)	1.2,2 (5)	2,2 (5)
CUY-2-BOLANZ		1.1,1.5 (5)	2,2 (5)	1.4,2 (5)	2,2 (5)	1.6,2 (5)	1.2,2 (5)	2,2 (5)		1.6,2 (5)	1.4,2 (5)	2,2 (5)
> CUY-3-WWTP	1.4,2 (8)	1.3,2 (8)	2,2 (8)	1.9,2 (8)	1.9,2 (8)	1.9,2 (8)	1.6,2 (8)	2,2 (8)	1.1,2 (8)	1.6,2 (8)	1.5,2 (8)	**2.5,3 (8)**
> CUY-4-UP		1.1,1.5 (5)	1.8,2 (5)	1.2,2 (5)	2,2 (5)			1.4,2 (5)		2,2 (5)		1.8,2 (5)
> CUY-5-LaDUE					1.6,2 (5)		1.4,2 (5)					

Table B-17a continued. Cuyahoga River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Circulatory/Blood Constituents**			**Endocrine**		**Gross Pathology**	**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	Carbamazepine	**DEET**	**Sitosterol, beta-**	**DEET**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
CUY-1-ROCK	2,2 (5)		1.4,2 (5)	**2.2,3 (5)**	**2.4,3 (5)**		2,2 (5)	2,2 (5)	2,2 (5)	2,2 (5)	1.6,2 (5)	2,2 (5)
CUY-2-BOLANZ	2,2 (5)	1.2,2 (5)	1.2,2 (5)	**2.2,3 (5)**	**2.6,3 (5)**		2,2 (5)	2,2 (5)	2,2 (5)	2,2 (5)	1.2,2 (5)	2,2 (5)
> CUY-3-WWTP	2,2 (8)	1.5,2 (8)	2,2 (8)	**2.6,3 (8)**	**2.9,3 (8)**	1.1,2 (8)	2,2 (8)	**2.1,3 (8)**	2,2 (8)	2,2 (8)	**1.8,3 (8)**	2,2 (8)
> CUY-4-UP	2,2 (5)		1.4,2 (5)	2,2 (5)	1.8,2 (5)		2,2 (5)	1.8,2 (5)	2,2 (5)	2,2 (5)		2,2 (5)
> CUY-5-LaDUE				1.8,2 (5)							1.4,2 (5)	1.2,2 (5)

Table B-17b. Cuyahoga River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**										**Behavioral**							
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**HHCB**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
CUY-1-ROCK				1.2,2 (5)	1.8,2 (5)		1.6,2 (5)		1.2,2 (5)	2,2 (5)	1.6,2 (5)	1.2,2 (5)		1.6,2 (5)		1.4,2 (5)	1.2,2 (5)	2,2 (5)
CUY-2-BOLANZ		1.1,1.5 (5)		1.4,2 (5)	2,2 (5)	1.2,2 (5)	1.2,2 (5)		1.4,2 (5)	2,2 (5)	1.8,2 (5)	1.4,2 (5)	1.2,2 (5)	1.2,2 (5)		1.6,2 (5)	1.4,2 (5)	2,2 (5)
> CUY-3-WWTP	1.4,2 (8)	1.3,2 (8)	1.5,2 (8)	1.9,2 (8)	1.9,2 (8)	1.8,2 (8)	1.6,2 (8)	1.3,2 (8)	1.5,2 (8)	2,2 (8)	2,2 (8)	1.9,2 (8)	1.9,2 (8)	1.6,2 (8)	1.1,2 (8)	2,2 (8)	1.5,2 (8)	2,2 (8)
> CUY-4-UP		1.1,1.5 (5)		1.2,2 (5)	2,2 (5)					1.8,2 (5)		1.2,2 (5)				1.8,2 (5)		1.8,2 (5)
> CUY-5-LaDUE					1.8,2 (5)		1.2,2 (5)							1.4,2 (5)		1.4,2 (5)		

Table B-17b continued. Cuyahoga River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**						**Growth**	**Mortality**			**Reproductive**				
	Bisphenol A	**Carbamazepine**	**Diphenhydramine**	**Estrone**	**TBEP**	**Triclosan**	**Bisphenol A**	**DEET**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Triclosan**	**Venlafaxine**
CUY-1-ROCK	1.1,1.5 (5)	2,2 (5)		1.6,2 (5)		1.2,2 (5)		1.8,2 (5)	1.2,2 (5)	2,2 (5)	1.1,1.5 (5)	2,2 (5)	1.6,2 (5)	1.2,2 (5)	2,2 (5)
CUY-2-BOLANZ	1.1,1.5 (5)	2,2 (5)		1.2,2 (5)	1.2,2 (5)	1.4,2 (5)	1.1,1.5 (5)	2,2 (5)	1.4,2 (5)	2,2 (5)	1.1,1.5 (5)	2,2 (5)	1.2,2 (5)	1.4,2 (5)	2,2 (5)
> CUY-3-WWTP	1.3,2 (8)	2,2 (8)	1.1,2 (8)	1.6,2 (8)	1.3,2 (8)	1.5,2 (8)	1.2,2 (8)	1.9,2 (8)	1.5,2 (8)	**2.8,3 (8)**	1.3,2 (8)	2,2 (8)	1.6,2 (8)	1.5,2 (8)	2,2 (8)
> CUY-4-UP	1.1,1.5 (5)	1.8,2 (5)					1.1,1.5 (5)	2,2 (5)		1.8,2 (5)	1.1,1.5 (5)	2,2 (5)			1.8,2 (5)
> CUY-5-LaDUE	1.1,1.5 (5)			1.4,2 (5)				1.8,2 (5)			1.1,1.5 (5)		1.2,2 (5)		

Table B-18a. Tinkers Creek project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**											**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**TBEP**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
TIC-1					1.3,2 (3)					1.3,2 (3)				1.3,2 (3)
> TIC-2			1.7,2 (3)	1.3,2 (3)	2,2 (3)	1.3,2 (3)		1.7,2 (3)			2,2 (3)	2,2 (3)		
TIC-3			2,2 (3)	1.3,2 (3)	2,2 (3)		1.3,2 (3)	2,2 (3)		1.3,2 (3)	2,2 (3)	2,2 (3)		1.3,2 (3)
> TIC-4			2,2 (3)	1.7,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)	1.7,2 (3)		1.3,2 (3)	2,2 (3)	2,2 (3)		1.3,2 (3)
> TIC-5	1.7,2 (6)	1.2,1.5 (6)	2,2 (6)	1.7,2 (6)	1.8,2 (6)	2,2 (6)	1.5,2 (6)	2,2 (6)	1.5,2 (2)	1.7,2 (6)	**2.7,3 (6)**	2,2 (6)	1.2,2 (6)	1.7,2 (6)
> TIC-6		1.2,1.5 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)	2,2 (3)		1.7,2 (3)	2,2 (3)	2,2 (3)		1.3,2 (3)
> TIC-7			2,2 (3)	2,2 (3)	2,2 (3)	1.7,2 (3)	1.3,2 (3)	2,2 (3)		1.7,2 (3)	2,2 (3)	2,2 (3)		
> TIC-8	1.7,2 (6)		2,2 (6)	2,2 (6)	1.7,2 (6)	2,2 (6)	**2.2,3 (6)**	2,2 (6)	2,2 (2)	1.8,2 (6)	**2.2,3 (6)**	2,2 (6)	1.3,2 (6)	1.5,2 (6)
TIC-9			2,2 (3)	1.7,2 (3)	2,2 (3)			2,2 (3)		2,2 (3)	2,2 (3)	2,2 (3)		

Table B-18a continued. Tinkers Creek project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Genotoxicity**	**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Ibuprofen**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
TIC-1	2,2 (3)								
> TIC-2	2,2 (3)	**2.7,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)		2,2 (3)
TIC-3	**2.3,3 (3)**	**2.7,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)
> TIC-4	**2.3,3 (3)**	**3,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)
> TIC-5	**2.3,3 (6)**	**3,3 (6)**	**2,3 (2)**	**2.3,3 (6)**	**2.5,3 (6)**	2,2 (6)	2,2 (6)	**1.7,3 (6)**	2,2 (6)
> TIC-6	2,2 (3)	**3,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)
> TIC-7	2,2 (3)	**3,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	2,2 (3)
> TIC-8	**2.3,3 (6)**	**3,3 (6)**	**3,3 (2)**	**2.2,3 (6)**	2,2 (6)	2,2 (6)	2,2 (6)	**2.8,3 (6)**	2,2 (6)
TIC-9	**2.3,3 (3)**	**2.3,3 (3)**		2,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)		2,2 (3)

Table B-18b. Tinkers Creek project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**											**Behavioral**							
	4-Androstene-3,17-dione	**Bisphenol A**	**Carbamazepine**	**Citalopram**	**DEET**	**Diphenhydramine**	**Estrone**	**HHCB**	**Ibuprofen**	**TBEP**	**Venlafaxine**	**Carbamazepine**	**Citalopram**	**Diphenhydramine**	**Estrone**	**HHCB**	**Sitosterol, beta-**	**TBEP**	**Venlafaxine**
TIC-1					2,2 (3)												1.7,2 (3)		
> TIC-2			1.3,2 (3)	1.3,2 (3)	2,2 (3)						2,2 (3)	1.7,2 (3)	1.3,2 (3)				1.3,2 (3)		2,2 (3)
TIC-3			1.3,2 (3)	1.3,2 (3)	2,2 (3)		1.3,2 (3)				2,2 (3)	1.7,2 (3)	1.3,2 (3)		1.3,2 (3)		1.7,2 (3)		2,2 (3)
> TIC-4			1.3,2 (3)	1.7,2 (3)	2,2 (3)		1.3,2 (3)				2,2 (3)	2,2 (3)	1.7,2 (3)		1.3,2 (3)		2,2 (3)		2,2 (3)
> TIC-5	1.2,2 (6)	1.2,1.5 (6)	2,2 (6)	1.7,2 (6)	1.8,2 (6)	2,2 (6)	1.5,2 (6)	1.3,2 (6)	1.5,2 (2)	1.7,2 (6)	**2.2,3 (6)**	2,2 (6)	1.7,2 (6)	2,2 (6)	1.5,2 (6)	1.7,2 (6)	1.8,2 (6)	1.3,2 (6)	2,2 (6)
> TIC-6			1.3,2 (3)	2,2 (3)	2,2 (3)		1.3,2 (3)			1.3,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)	1.3,2 (3)		1.3,2 (3)		2,2 (3)
> TIC-7				2,2 (3)	2,2 (3)		1.3,2 (3)			1.3,2 (3)	2,2 (3)	2,2 (3)	2,2 (3)		1.3,2 (3)		1.3,2 (3)		2,2 (3)
> TIC-8	1.7,2 (6)		2,2 (6)	2,2 (6)	1.8,2 (6)	2,2 (6)	2,2 (6)	1.2,2 (6)	2,2 (2)	1.7,2 (6)	2,2 (6)	2,2 (6)	2,2 (6)	2,2 (6)	2,2 (6)	1.8,2 (6)	1.8,2 (6)		2,2 (6)
TIC-9				1.7,2 (3)	2,2 (3)					1.3,2 (3)	2,2 (3)	2,2 (3)	1.3,2 (3)				1.7,2 (3)		2,2 (3)

Table B-18b continued. Tinkers Creek project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score > 1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**						**Growth**	**Mortality**					**Reproductive**				
	Bisphenol A	**Carbamazepine**	**Estrone**	**HHCB**	**Ibuprofen**	**TBEP**	**HHCB**	**DEET**	**HHCB**	**Ibuprofen**	**TBEP**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Ibuprofen**	**Venlafaxine**
TIC-1	1.2,1.5 (3)							2,2 (3)					1.2,1.5 (3)				
> TIC-2	1.2,1.5 (3)	1.7,2 (3)						2,2 (3)				**2.7,3 (3)**	1.2,1.5 (3)	2,2 (3)			2,2 (3)
TIC-3	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)					2,2 (3)				2,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)		2,2 (3)
> TIC-4	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)					2,2 (3)				**2.3,3 (3)**	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)		2,2 (3)
> TIC-5	1.2,1.5 (6)	2,2 (6)	1.5,2 (6)	1.3,2 (6)	**2,3 (2)**	1.7,2 (6)	1.2,2 (6)	1.8,2 (6)	1.2,2 (6)	1.5,2 (2)	1.5,2 (6)	**3,3 (6)**	1.2,1.5 (6)	2,2 (6)	1.5,2 (6)	**2,3 (2)**	2,2 (6)
> TIC-6	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)			1.3,2 (3)		2,2 (3)				**2.3,3 (3)**	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)		2,2 (3)
> TIC-7	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)			1.3,2 (3)		2,2 (3)			1.3,2 (3)	2,2 (3)	1.2,1.5 (3)	2,2 (3)	1.3,2 (3)		2,2 (3)
> TIC-8	1.2,1.5 (6)	2,2 (6)	2,2 (6)	1.2,2 (6)	**3,3 (2)**	1.7,2 (6)	1.2,2 (6)	1.8,2 (6)	1.2,2 (6)	2,2 (2)	1.7,2 (6)	**3,3 (6)**	1.2,1.5 (6)	2,2 (6)	2,2 (6)	**3,3 (2)**	2,2 (6)
TIC-9	1.2,1.5 (3)	2,2 (3)				1.3,2 (3)		2,2 (3)			1.3,2 (3)	2,2 (3)	1.2,1.5 (3)	2,2 (3)			2,2 (3)

Table B-19a. Ashtabula River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Circulatory/Blood Constituents	Endocrine
	Sitosterol, beta-	DEET
ASH-1	2,2 (1)	2,2 (1)
ASH-2	2,2 (1)	2,2 (1)
ASH-3		2,2 (1)

Table B-19b. Ashtabula River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Population-relevant SVs	Behavioral	Mortality
	DEET	Sitosterol, beta-	DEET
ASH-1	2,2 (1)	2,2 (1)	2,2 (1)
ASH-2	2,2 (1)	2,2 (1)	2,2 (1)
ASH-3	2,2 (1)		2,2 (1)

Table B-20a. Long Pond project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Comprehensive SVs				Circulatory/Blood Constituents	Endocrine	Physiological/ Metabolic
	4-Androstene-3,17-dione	DEET	Estrone	Triclosan	Sitosterol, beta-	DEET	Estrone
LP_South		2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)	
LP01		2,2 (1)				2,2 (1)	
LP02		2,2 (1)				2,2 (1)	
LP04	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)
LP06		2,2 (1)				2,2 (1)	
LP06-REF						2,2 (1)	

Table B-20b. Long Pond project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Population-relevant SVs				Behavioral			Developmental		Mortality		Reproductive	
	4-Androstene-3,17-dione	DEET	Estrone	Triclosan	Estrone	Sitosterol, beta-	Triclosan	Estrone	Triclosan	DEET	Triclosan	Estrone	Triclosan
LP_South		2,2 (1)		2,2 (1)		2,2 (1)	2,2 (1)		2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)
LP01		2,2 (1)				2,2 (1)				2,2 (1)			
LP02		2,2 (1)				2,2 (1)				2,2 (1)			
LP04	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)		2,2 (1)	
LP06		2,2 (1)				2,2 (1)				2,2 (1)			
LP06-REF		2,2 (1)				2,2 (1)				2,2 (1)			

Table B-21a. Genesee River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**	**Endocrine**	**Physiological/ Metabolic**	
	Estrone	**DEET**	**Estrone**	**HHCB**
GNR-1	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)
> GNR-2		1.5,2 (2)		1.5,2 (2)
> GNR-3	2,2 (1)		2,2 (1)	2,2 (1)
> GNR-4	2,2 (1)		2,2 (1)	2,2 (1)
> GNR-5				2,2 (1)
GNR-6		1.5,2 (2)		1.5,2 (2)

Table B-21b. Genesee River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**		**Behavioral**		**Developmental**	**Mortality**	**Reproductive**
	DEET	**Estrone**	**Estrone**	**Sitosterol, beta-**	**Estrone**	**DEET**	**Estrone**
GNR-1	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)	1.5,2 (2)
> GNR-2	1.5,2 (2)			1.5,2 (2)		1.5,2 (2)	
> GNR-3		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)		2,2 (1)
> GNR-4		2,2 (1)	2,2 (1)		2,2 (1)		2,2 (1)
GNR-6	1.5,2 (2)					1.5,2 (2)	

Table B-22a. Irondequoit Bay project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Comprehensive SVs			Circulatory/Blood Constituents	Endocrine	Physiological/ Metabolic
	4-Androstene-3,17-dione	DEET	Estrone	Sitosterol, beta-	DEET	Estrone
IB_NE_DUNE					2,2 (1)	
IB_NW_PHRAG			2,2 (1)		2,2 (1)	2,2 (1)
IB04		2,2 (1)			2,2 (1)	
IB05	2,2 (1)				2,2 (1)	
IB06				2,2 (1)	2,2 (1)	
IB06_REF					2,2 (1)	

Table B-22b. Irondequoit Bay project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites	Mean Population-relevant SVs			Behavioral		Developmental	Mortality	Reproductive
	4-Androstene-3,17-dione	DEET	Estrone	Estrone	Sitosterol, beta-	Estrone	DEET	Estrone
IB_NE_DUNE		2,2 (1)			2,2 (1)		2,2 (1)	
IB_NW_PHRAG		2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)	2,2 (1)
IB04		2,2 (1)			2,2 (1)		2,2 (1)	
IB05	2,2 (1)	2,2 (1)			2,2 (1)		2,2 (1)	
IB06		2,2 (1)			2,2 (1)		2,2 (1)	
IB06_REF		2,2 (1)					2,2 (1)	

Table B-23a. Oswegatchie River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**			**Circulatory/Blood Constituents**	**Endocrine**	**Physiological/ Metabolic**
	DEET	**Estrone**	**Sitosterol, beta-**	**Sitosterol, beta-**	**DEET**	**Estrone**
OSW-1			1.4,2 (5)	1.6,2 (5)	1.6,2 (5)	
> OSW-2				1.2,2 (6)	1.5,2 (6)	
OSW-3	1.2,2 (6)		1.5,2 (6)	1.7,2 (6)	1.3,2 (6)	
OSW-4		1.2,2 (6)	1.7,2 (6)	1.8,2 (6)	1.5,2 (6)	1.2,2 (6)
> OSW-5				1.1,2 (7)	1.4,2 (7)	

Table B-23b. Oswegatchie River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**			**Behavioral**		**Developmental**	**Mortality**	**Reproductive**
	DEET	**Estrone**	**Sitosterol, beta-**	**Estrone**	**Sitosterol, beta-**	**Estrone**	**DEET**	**Estrone**
OSW-1	1.6,2 (5)				1.6,2 (5)		1.6,2 (5)	
> OSW-2	1.5,2 (6)				1.2,2 (6)		1.5,2 (6)	
OSW-3	1.3,2 (6)				1.7,2 (6)		1.3,2 (6)	
OSW-4	1.5,2 (6)	1.2,2 (6)	1.2,2 (6)	1.2,2 (6)	1.8,2 (6)	1.2,2 (6)	1.5,2 (6)	1.2,2 (6)
> OSW-5	1.4,2 (7)				1.1,2 (7)		1.4,2 (7)	

Table B-24a. Raquette River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Comprehensive SVs**							**Circulatory/Blood Constituents**		
	4-Androstene-3,17-dione	**DEET**	**Estrone**	**Sitosterol, beta-**	**TBEP**	**Triclosan**	**Venlafaxine**	**Carbamazepine**	**DEET**	**Sitosterol, beta-**
> **RAQ-1-NOR**		1.5,2 (8)			1.3,2 (8)	1.3,2 (8)	1.3,2 (8)	1.3,2 (8)		
> **RAQ-2-WWTP**		1.1,2 (8)								
RAQ-3										
RAQ-4-PIERCE		1.5,2 (8)		1.1,2 (8)					1.1,2 (8)	1.3,2 (8)
> **RAQ-5-RAQ**	1.1,2 (8)	1.5,2 (8)	1.3,2 (8)			1.1,2 (8)	1.1,2 (8)	1.1,2 (8)		1.3,2 (8)
RAQ-6-TUPPER	1.1,2 (8)	1.1,2 (8)								1.3,2 (8)

Table B-24a continued. Raquette River project location Hazard Scores, for CECs and **Comprehensive Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Endocrine**		**Histopathology**		**Neurological**	**Physiological/ Metabolic**		
	DEET	**Venlafaxine**	**Carbamazepine**	**Venlafaxine**	**Carbamazepine**	**Carbamazepine**	**Estrone**	**HHCB**
> RAQ-1-NOR	1.6,2 (8)	1.3,2 (8)	1.5,2 (8)	1.3,2 (8)	1.3,2 (8)	1.3,2 (8)		2,2 (8)
> RAQ-2-WWTP	1.5,2 (8)							
RAQ-3	1.3,2 (6)							
RAQ-4-PIERCE	**2.1,3 (8)**							
> RAQ-5-RAQ	**1.9,3 (8)**	1.1,2 (8)	1.1,2 (8)	1.1,2 (8)	1.1,2 (8)	1.1,2 (8)	**1.4,3 (8)**	1.5,2 (8)
RAQ-6-TUPPER	1.6,2 (8)							

Table B-24b. Raquette River project location. Sample Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Mean Population-relevant SVs**				**Behavioral**			
	DEET	**Estrone**	**Triclosan**	**Venlafaxine**	**Estrone**	**Sitosterol, beta-**	**Triclosan**	**Venlafaxine**
> RAQ-1-NOR	1.6,2 (8)		1.3,2 (8)	1.3,2 (8)		1.3,2 (8)	1.3,2 (8)	1.3,2 (8)
> RAQ-2-WWTP	1.5,2 (8)					1.5,2 (8)		
RAQ-3	1.3,2 (6)					1.5,2 (6)		
RAQ-4-PIERCE	1.9,2 (8)					1.6,2 (8)		
> RAQ-5-RAQ	1.6,2 (8)	1.3,2 (8)	1.1,2 (8)	1.1,2 (8)	1.3,2 (8)	1.8,2 (8)	1.1,2 (8)	1.1,2 (8)
RAQ-6-TUPPER	1.6,2 (8)					1.8,2 (8)		

Table B-24b continued. Raquette River project location Hazard Scores, for CECs and **Population-relevant Effect Categories** with at least one observation where Hazard Score >1 (SV_{LOW} exceeded). Cell contents are 2mean, maximum and sample size [$\bar{x}$, max (N)], where (N) is the number of sampling events analyzed for the CEC. *Blank:* either all hazard scores = 1, or no usable chemical analytical results. *Red shading* = at least one exposure event concentration > SV_{HIGH}.

Sampling Sites (Bold ">" = potentially influenced by mapped CEC point source)	**Developmental**					**Mortality**			**Reproductive**				
	Bisphenol A	**Carbamazepine**	**Estrone**	**TBEP**	**Triclosan**	**DEET**	**Triclosan**	**Venlafaxine**	**Bisphenol A**	**Carbamazepine**	**Estrone**	**Triclosan**	**Venlafaxine**
> RAQ-1-NOR	1.1,1.5 (8)	1.1,2 (8)		1.1,2 (8)	1.3,2 (8)	1.6,2 (8)	1.3,2 (8)	1.3,2 (8)	1.1,1.5 (8)	1.5,2 (8)		1.3,2 (8)	1.3,2 (8)
> RAQ-2-WWTP						1.5,2 (8)							
RAQ-3	1.2,1.5 (6)					1.3,2 (6)			1.2,1.5 (6)				
RAQ-4-PIERCE	1.1,1.5 (8)					1.9,2 (8)			1.1,1.5 (8)				
> RAQ-5-RAQ	1.1,1.5 (8)		1.3,2 (8)		1.1,2 (8)	1.6,2 (8)	1.1,2 (8)	1.1,2 (8)	1.1,1.5 (8)	1.1,2 (8)	1.3,2 (8)	1.1,2 (8)	1.1,2 (8)
RAQ-6-TUPPER						1.6,2 (8)							

ATTACHMENT C. Data used as input to the rubric for assigning Breadth of Ecotoxicity Information scores to Effect-specific screening values.

Input data for screening value breadth of information scoring are summarized. These data are inputs to the rubric supplied in Table 5-2 in this document for scoring breadth of ecotoxicity information for each SV utilized in this EHA. Data presented in the following four tables were extracted from Section 4.4 and Attachments 4-2a,b,c,d *in* Gefell et al. (2019).

Table C-1. Summary of Number of Fish Species used in assigning Comprehensive Effect-specific SV breadth of information scores. Cell contents are numbers of fish species tested in assays that were used in deriving Effect-specific SVs for the given CEC and Effect Category. Gray shading = no SV pair available.

Comprehensive Effect Category	SV Type (SV_{HIGH} or SV_{LOW})	4-Androstenedione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta	TBEP	Triclosan	Venlafaxine
Circulatory/ Blood Constituents	SV_{HIGH}			1		1				1		1			
	SV_{LOW}			1		1				1		1			
Endocrine	SV_{HIGH}					1				1					1
	SV_{LOW}					1				1					1
Genotoxicity	SV_{HIGH}									1					
	SV_{LOW}									1					
Gross Pathology	SV_{HIGH}		1												
	SV_{LOW}		2												
Histopathology	SV_{HIGH}			2											1
	SV_{LOW}			2											2
Neurological	SV_{HIGH}			1											
	SV_{LOW}			1											
Physiological/Metabolic	SV_{HIGH}			1				1	1	1					
	SV_{LOW}			1				1	1	1					

Table C-2. Summary of Number of Fish Species to be used in assigning Population-relevant Effect-specific breadth of information scores. Cell contents are numbers of fish species tested in assays that were used in deriving Effect-specific SVs for the given CEC and Effect Category. Gray shading = no SV pair available.

Population-relevant Effect Category	SV Type (SV_{HIGH} or SV_{LOW})	4-Androstenedione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta	TBEP	Triclosan	Venlafaxine
Behavioral	SV_{HIGH}		1	4	1		1	1	1		1	2	1	4	1
	SV_{LOW}		1	4	2		1	1	1		1	2	1	4	1
Developmental	SV_{HIGH}		5	2			1	2	1	2		3	1	3	
	SV_{LOW}		6	2			1	3	2	3		4	1	4	
Growth	SV_{HIGH}	1	1	1					1						
	SV_{LOW}	1	5	2					1						
Mortality	SV_{HIGH}		2	1		1			1	3			1	1	1
	SV_{LOW}		5	2		2			1	3			1	2	1
Reproductive	SV_{HIGH}		7	1				2		2				1	1
	SV_{LOW}		8	1				3		2				3	2

Table C-3. Summary of Number of Effect Endpoints used in assigning Comprehensive Effect-specific SV breadth of information scores. Cell contents are numbers of effect endpoints for the given CEC and Effect Category tested in assays used in deriving Effect-specific SVs. Gray shading = no SV pair available.

Comprehensive Effect Category	SV Type (SV_{HIGH} or SV_{LOW})	4-Androstenedione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta	TBEP	Triclosan	Venlafaxine
Circulatory/ Blood Constituents	SV_{HIGH}			3		21				9		1			
	SV_{LOW}			3		21				8		1			
Endocrine	SV_{HIGH}					10				1					1
	SV_{LOW}					10				1					1
Genotoxicity	SV_{HIGH}									3					
	SV_{LOW}									3					
Gross Pathology	SV_{HIGH}		1												
	SV_{LOW}		3												
Histopathology	SV_{HIGH}			3											2
	SV_{LOW}			3											3
Neurological	SV_{HIGH}			1											
	SV_{LOW}			1											
Physiological/Metabolic	SV_{HIGH}			4				1	2	2					
	SV_{LOW}			4				1	2	2					

Table C-4. Summary of Number of Effect Endpoints to be used in assigning Population-relevant Effect-specific SV breadth of information scores. Cell contents are numbers of effect endpoints for the given CEC and Effect Category tested in assays used to derive Effect-specific SVs. Gray shading = no SV pair available.

Population-relevant Effect Category	SV Type (SV_{HIGH} or SV_{LOW})	4-Androstenedione	Bisphenol A	Carbamazepine	Citalopram	DEET	Diphenhydramine	Estrone	HHCB	Ibuprofen	Lidocaine	Sitosterol, beta	TBEP	Triclosan	Venlafaxine
Behavioral	SV_{HIGH}		1	7	7		1	2	4		2	5	1	9	2
	SV_{LOW}		1	7	11		1	3	4		2	5	1	13	2
Developmental	SV_{HIGH}		29	20			2	15	5	12		9	4	6	
	SV_{LOW}		29	24			2	16	10	15		11	4	12	
Growth	SV_{HIGH}	2	2	1					2						
	SV_{LOW}	2	2	4					2						
Mortality	SV_{HIGH}		NA	NA		NA			NA	NA			NA	NA	NA
	SV_{LOW}		NA	NA		NA			NA	NA			NA	NA	NA
Reproductive	SV_{HIGH}		20	8				7		12				2	6
	SV_{LOW}		20	8				6		12				7	8

ATTACHMENT D.

Supplemental Statistical Analysis of Hazard Associated with CEC Point Sources – All Hazard Scores Utilized

The potential for CEC point sources to influence hazard from CEC water exposures in fish was statistically explored. Chapter 5 provides results of analyses that compared site-specific maximum and median hazard between two groups of sampling sites – point source CEC-influenced sites and uninfluenced sites. Each sampling site had been assigned a designation as either 'influenced' or 'uninfluenced' by CEC point sources based on proximity to mapped WWTPs and CSOs. The process to assign CEC influence designation is described in Section 5.3.4.

This attachment describes a supplemental analysis that *utilized all of the sample-specific hazard data*[3] for each sampling site, not just the site-specific maximum and median values. For each effect category, hazard due to CEC exposure was scored for each CEC in each sample (Section 5.2). Each sample was assigned to either the 'CEC-influenced' or 'uninfluenced' groups based on the location of the sampling site where it was collected relative to CEC point sources (WWTPs or CSOs) (Section 5.3.4). The CEC influence status of each of the 195 sampling sites to the nearest point source is provided in Attachment A, Table A-2. Within each project location, hazard scores were compared between CEC-influenced and uninfluenced sample groups with the nonparametric Wilcoxon Rank Sum test for ordinal data, using SAS for Windows 9.4 (PROC NPAR1WAY). Statistical comparisons were conducted for each possible CEC and effect category combination (see Chapter 4, Table 4-1). Statistical comparisons resulting in a p-value < 0.1 were considered to indicate a statistically significant difference in hazard scores between the groups.

The advantage to using all samples collected at each site, rather than just the maximum or median, is that the total sample size was increased – in some cases substantially – so statistical power to detect hazard differences was greater for sample group comparisons.

The most significant disadvantage to using sample-based hazard data in this way is potential bias due to pseudoreplication (or, spatial autocorrelation of samples) within sites – where hazard results from multiple samples at a single site are more similar to each other than to hazard results at a different site. For project locations where sites with large numbers of samples are unevenly distributed between the CEC-influenced and uninfluenced sample groups, this could bias the results.

Nevertheless, given these caveats, this Attachment provides additional substantive information relevant to the evaluation of point sources on CEC-related hazard in fish.

The subsections in this attachment provide results by project location (in the same order as in Section 5.4).

[3]Data used for this statistical analysis using all samples ***also included*** hazard scores for 11 estimated aqueous concentrations from unfiltered concentrations of each of five pharmaceutical CECs that were replicate to measured aqueous concentrations in paired filtered samples collected in Tinkers Creek in 2013. The 55 hazard scores (5 CECs x 11 samples) from the unfiltered samples were ***not used*** in any of the analyses presented in Part A, Volume I.

St. Louis River/Bay

At the St. Louis River/Bay project location there were 17 observations of a statistically significant difference ($p < 0.1$; Wilcoxon Test) in hazard scores between CEC point source influenced and uninfluenced sample groups. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores.

Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

St. Louis River/Bay	Bisphenol A	DEET	HHCB	Ibuprofen	Sitosterol, β	TBEP
Population-relevant						
**** Population-relevant Mean SV**	0.10			**0.17**		
Behavioral					0.22	
**** Developmental**	0.10			**0.17**		
Growth	0.07					
**** Mortality**				**0.17**		
**** Reproductive**	0.10			**0.17**		
Comprehensive						
Comprehensive Mean SV	0.10	0.42		0.17		0.14
Circulatory/Blood Constituents		0.10				
**** Endocrine**		**0.26**				
**** Genotoxicity**				**0.35**		
**** Physiological/Metabolic**			**0.21**			

** Red-highlighted values also had at least one exceedance of an SV_{HIGH} (hazard score = 3) (see Attachment B).

Waupaca Chain O'Lakes

No point source influenced-uninfluenced statistical comparison was possible. Neither of the two sampling sites at the Waupaca Chain O'Lakes project location was considered influenced by a mapped CEC point source, and sample size was 2 at each site (Table A-2).

Little Lake Butte des Morts

There were no statistically significant hazard score differences between the samples collected at the uninfluenced upstream site (LLB-1) and samples collected at the four CEC-influenced downstream sites.

Fox River/Green Bay

At the Fox River/Green Bay project location, there were 11 observations of a statistically significant difference ($p < 0.1$; Wilcoxon Test) in hazard scores between point source influenced and uninfluenced sample groups. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Fox River/Green Bay	Carbamazepine	HHCB	Venlafaxine
Population-relevant			
Behavioral			0.31
Mortality			0.31
Reproductive	0.48		0.31
Comprehensive			
Comprehensive Mean SV			0.31
Circulatory/Blood Constituents	0.56		
Histopathology	0.40		0.31
Neurological	0.56		
Physiological/Metabolic	0.56	0.63	

There was no overlap between the occurrence of statistically significant differences in hazard scores for carbamazepine, HHCB and venlafaxine, and the occurrence of SV_{HIGH} exceedances for DEET, ibuprofen and venlafaxine (see Attachment B). A possible explanation for this is that SV_{HIGH} exceedances were distributed relatively evenly between influenced and uninfluenced sites, resulting in no significant difference.

Kewaunee River

At the Kewaunee River project location there were two observations of a statistically significant difference ($p < 0.1$; Wilcoxon Test) in hazard scores between point source influenced and uninfluenced site groups, both related to carbamazepine exposure. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups

Kewaunee River	Carbamazepine
Population-relevant	
Reproductive	0.38
Comprehensive	
Histopathology	0.54

There was no overlap between the occurrence of statistically significant differences in hazard scores for reproductive and histopathology effects and the occurrence of SV_{HIGH} exceedances for DEET endocrine effects. One possible explanation for this is that SV_{HIGH} exceedances were distributed between influenced and uninfluenced sites (Attachment B), resulting in no significant difference for endocrine hazard.

Milwaukee River

All four sampling sites were identified as CEC-influenced by mapped point sources (Attachment A2.6), so no influenced-uninfluenced comparison was possible.

North Shore Channel

All three sampling sites were identified as influenced by mapped point sources (Attachment A2.7), so no influenced-uninfluenced comparison was possible.

Little Calumet River

Since the Little Calumet River flows in both directions (depending on the level of Lake Michigan), all three sampling sites were considered both upstream and downstream of all neighboring mapped point sources (Attachment A2.8), so no influenced-uninfluenced comparison was possible.

Grand River/Maple River

No statistically significant ($p < 0.1$) differences were observed between the two sample groups. High hazard was evenly split between CEC-influenced and uninfluenced sites (see Attachment B). Factors contributing to a lack of significant hazard differences include an absence of high hazard observations for most Effect Categories (Attachment B) and small sample sizes (Attachment A2.9)

Saginaw River

At the Saginaw River project location there were eight observations of a statistically significant difference ($p < 0.1$; Wilcoxon Test) in hazard scores between point source influenced and uninfluenced sample groups. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Effect Category	Carbamazepine	Citalopram	HHCB	TBEP	Venlafaxine
Population-relevant					
Population-relevant Mean SV		0.33			
Behavioral		0.25			0.42
Reproductive	0.42				
Comprehensive					
Comprehensive Mean SV		0.33		0.33	
Histopathology	0.42				
Physiological/Metabolic			0.50		

There was no overlap between the occurrence of statistically significant differences in hazard for carbamazepine, citalopram, HHCB, TBEP and venlafaxine, and the occurrence of endocrine SV_{HIGH} exceedances for DEET (Attachment B). Observations of high hazard related to DEET endocrine effects was split between influenced and uninfluenced sites (Attachment B), so were not statistically different between the two sample groups. The wide-spread distribution of high DEET hazard may be due in part to unmapped CEC point sources or aerial deposition.

Despite no instances of high hazard for other CECs, there were eight statistically significant different comparisons in six effect categories and five CECs. Since there were eight sites identified as uninfluenced and six influenced (Attachment A2.10), numbers of samples in both groups were sufficiently large to identify significant differences in hazard. These results suggest a higher potential for biological impacts in fish (more exceedances of SV_{LOW}) in influenced sites than in uninfluenced sites at the Saginaw River project location.

St. Clair River

There were no statistically significant differences in hazard scores between point source CEC-influenced and uninfluenced sample groups at the St. Clair River location. This may be due in part to small total sample size in the uninfluenced group (n = 3) (Attachment A2.11), and that observations of SV_{LOW} exceedances were well distributed between influenced and uninfluenced sites (see Attachment B).

Clinton River

There were no statistically significant differences in hazard scores between point source influenced and uninfluenced sample groups at the Clinton River location. This may be due in part to small sample sizes per comparison group (Attachment A2.12), and that the two observations of high hazard from DEET endocrine effects were split between influenced and uninfluenced sites (see Attachment B).

Detroit River

There were no statistically significant differences in hazard scores between point source influenced and uninfluenced sample groups at the Detroit River location. Observations of high hazard were distributed evenly between the two groups, and SV_{LOW} exceedances were widespread across both sample groups (Attachment B).

River Raisin

A lack of statistically significant differences in hazard scores between the two sample groups at the River Raisin location is likely due in part to very limited sample sizes - only one sample analyzed per site (Attachment A2.14).

Swan Creek

All samples collected at the 13 Swan Creek sampling sites were identified as influenced by mapped CEC point sources (Attachment A2.15), so no influenced-uninfluenced comparison between sample groups was possible.

Maumee River

Seven statistically significant differences in hazard scores ($p < 0.1$; Wilcoxon Test) between point source influenced and uninfluenced sample groups were identified in the Maumee River project location. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Maumee River	Citalopram	Diphen-hydramine	HHCB
Population-relevant			
Population-relevant Mean SV	0.56		
Behavioral	0.56	0.28	
Comprehensive			
Comprehensive Mean SV	0.56	0.53	0.34
Physiological/Metabolic			0.50

There was no overlap between CECs having a statistically significant difference in sample hazard scores and CECs with SV_{HIGH} exceedances (Attachment B). SV_{HIGH} exceedances occurred at nine sites identified as either influenced or uninfluenced by mapped point sources. The occurrence of SV_{LOW} exceedances across CECs and effect categories is broadly distributed among CEC-influenced and uninfluenced sampling sites (Attachment B). Significant differences are likely for CECs with many observations of negligible hazard in the uninfluenced group. Observations of negligible hazard are predominant among samples collected at uninfluenced sites for citalopram, diphenhydramine, and HHCB in the Effect Categories included in the chart above.

Cuyahoga River

Six statistically significant differences in hazard scores ($p < 0.1$; Wilcoxon Test) between point source influenced and uninfluenced sample groups were identified in the Cuyahoga River project location. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Cuyahoga River	Carbamazepine	Diphenhydramine	Sitosterol, beta-	Venlafaxine
Population-relevant				
Population-relevant Mean SV	0.31	0.36		
Behavioral		0.44	0.42	
**** Mortality**				**0.38**
Comprehensive				
Circulatory/Blood Constituents			0.47	

** Red-highlighted values also had at least one exceedance of an SV_{HIGH} (hazard score = 3) (see Attachment B).

There was little overlap between CECs having a statistically significant point source influenced-uninfluenced difference in hazard scores and CECs with SV_{HIGH} exceedances. Exceedances of SV_{LOW} values (hazard score = 2) are widespread (Attachment B). Significant differences in hazard scores are likely due in part to a preponderance of observations of negligible hazard in the uninfluenced sites for the indicated CECs and effect categories.

Tinkers Creek

There were 31 statistically significant differences ($p < 0.1$) in hazard scores between point source influenced and uninfluenced site groups that were identified in the Tinkers Creek project location. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Tinkers Creek	4-Androstene-3,17-dione	Carbam-azepine	Citalopram	Diphen-hydramine	Estrone	HHCB	Venla-faxine
Population-relevant							
**** Population-relevant Mean SV**		0.44	0.43	0.50	0.39		**0.46**
Behavioral		0.39	0.51	0.56	0.39	0.38	0.33
Developmental		0.30			0.39		
**** Mortality**							**0.85**
Reproductive		0.33			0.39		0.33
Comprehensive							
**** Comprehensive Mean SV**	0.33	0.30	**0.46**	0.70	**0.43**	0.25	**0.61**
Circulatory/Blood Constituents		0.33					
**** Histopathology**		**0.55**					**0.55**
Neurological		0.33					
**** Physiological/Metabolic**		0.33			**0.64**	0.33	

** Red-highlighted values also had at least one exceedance of an SV_{HIGH} (hazard score = 3) (see Attachment B).

There was incomplete overlap between CECs having a statistically significant influenced-uninfluenced difference in sample hazard scores and CECs with SV_{HIGH} exceedances (see Attachment B). Generally, the occurrence of SV_{LOW} exceedances is broadly distributed among point source influenced and uninfluenced sampling sites, so significant differences not involving high hazard observations are most likely for CECs with many observations of negligible hazard in the uninfluenced group.

Ashtabula River

All samples collected at the three Ashtabula River sites were designated as uninfluenced by point sources (Attachment A2.19, so no CEC influenced-uninfluenced comparisons were possible.

Long Pond

All samples collected from the six Long Pond sampling sites were designated as uninfluenced by CEC point sources (Attachment A2.20), so no influenced-uninfluenced comparisons were possible.

Genesee River

No statistically significant differences in hazard scores were observed between point source-influenced and uninfluenced sample groups at the Genesee River project location, possibly due to small total sample numbers in each group (Attachment A2.21) and the absence of any SV_{HIGH} exceedances (hazard score = 3) in either group (Attachment B).

Irondequoit Bay

All samples collected from the six Irondequoit Bay sampling sites were designated as uninfluenced by CEC point sources (Attachment A2.22), so no influenced-uninfluenced comparisons were possible.

Oswegatchie River

There were three statistically significant differences ($p < 0.1$) in hazard scores between point source influenced and uninfluenced site groups in the Oswegatchie River project location. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Oswegatchie River	Sitosterol, beta-
Population-relevant	
Behavioral	-0.55
Comprehensive	
Comprehensive Mean SV	-0.53
Circulatory/Blood Constituents	-0.55

Negative values in the chart indicate that mean hazard upstream of mapped point sources was greater than mean hazard below. These findings suggest that an unanticipated point source exists upstream of at least one of the uninfluenced sampling sites (see discussion in Section 5.4.23.4).

Raquette River

At the Raquette River project location there were three observations of a statistically significant difference ($p < 0.1$; Wilcoxon Test) in hazard scores between point source influenced and uninfluenced site groups. The Wilcoxon statistical test is nonparametric, so test results do not relate directly to mean hazard scores. Nevertheless, simply for illustration, we computed the difference in mean hazard scores (influenced group mean – uninfluenced group mean). The table below shows direction and magnitude of mean hazard score differences wherever the nonparametric Wilcoxon test showed a statistically significant difference between the groups.

Raquette River	Carbamazepine	HHCB
Population-relevant		
Reproductive	0.21	
Comprehensive		
Histopathology	0.21	
Physiological/Metabolic		0.50

There was no overlap between the CECs with statistically significant influenced-uninfluenced group differences in hazard scores and the CECs with SV_{HIGH} exceedances (see Attachment B). A possible partial explanation for this is that endocrine SV_{HIGH} exceedances were distributed between CEC-influenced and uninfluenced sites (Attachment B), resulting in no significant difference. Further, the occurrence of SV_{LOW} exceedances across CECs and effect categories is broadly distributed among influenced and uninfluenced sampling sites, so significant differences not involving high hazard observations are likely for CECs with many observations of negligible hazard in the uninfluenced group.