UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
77 WEST JACKSON BOULEVARD
CHICAGO, IL 60604-3590

21 NOV 2014

REPLY TO THE ATTENTION OF:

Mr. Roger Eberhardt, Acting Deputy Director
Office of the Great Lakes
Michigan Department of Environmental Quality
525 West Allegan Street
P.O. Box 30473
Lansing, Michigan 48909-7973

Dear Roger:

Thank you for your October 13, 2014 request to remove the "Degradation of Benthos" Beneficial Use Impairment (BUI) on the American side of the Binational St. Clair River Area of Concern (AOC). As you know, we share your desire to restore all of the Great Lakes AOCs and to formally delist them.

Based upon a review of your submittal and the supporting data, the U.S. Environmental Protection Agency hereby approves your BUI removal request to remove this BUI on the American side of the St. Clair River AOC. In addition, EPA will notify the International Joint Commission of this significant positive environmental change at this AOC.

We congratulate you and your staff, as well as the many federal, state, and local partners who have worked so hard and been instrumental in achieving this important environmental improvement. This progress will benefit not only the people who live and work in the St. Clair River AOC, but all the residents of the Great Lakes basin as well.

We look forward to the continuation of this important and productive relationship with your agencies and the local binational coordinating committee as we work together to delist this AOC in the years to come. If you have any further questions, please contact me at (312) 353-4891, or your staff may contact John Perrecone, at (312) 353-1149.

Sincerely,

Chris Korleski, Director
Great Lakes National Program Office

cc: Jon Allan, MDEQ
Melanie Foose, MDEQ
Rick Hobrla, MDEQ
Mark Burrows, IJC
Matthew Child, IJC
Wendy Carney, EPA, GLNPO
Rose Ellison, EPA, GLNPO

RICK SNYDER
GOVERNOR

STATE OF MICHIGAN
OFFICE OF THE GREAT LAKES
LANSING

JON W. ALLAN
DIRECTOR

October 13, 2014

Mr. Chris Korleski, Director
Great Lakes National Program Office
United States Environmental Protection Agency
Region 5
77 West Jackson Boulevard (G-17J)
Chicago, Illinois 60604-3507

Dear Mr. Korleski:

The purpose of this letter is to request the United States Environmental Protection Agency (USEPA), Great Lakes National Program Office's (GLNPO) concurrence with the removal of the Degradation of Benthos Beneficial Use Impairment (BUI) from the St. Clair River Area of Concern (AOC). The Michigan Department of Environmental Quality (MDEQ), Office of the Great Lakes (OGL) has assessed the status of this BUI in accordance with the state's *Guidance for Delisting Michigan's Great Lakes Areas of Concern*, and recommends that the BUI be removed from the list of impairments in the St. Clair River AOC.

Enclosed please find documentation to support this recommendation, including the BUI removal Briefing Paper prepared by the OGL's technical staff. The St. Clair River Binational Public Advisory Council provided a letter supporting this recommendation dated August 5, 2014. A copy is enclosed.

Also note that a public comment period was held between August 25, 2013, and September 8, 2013. No comments, either written or verbal, were received during the comment period.

We value our continuing partnership in the AOC Program and look forward to working with the GLNPO, in the removal of BUIs and the delisting of AOCs. If you need further information concerning this request, please contact Ms. Melanie Foose, OGL, at 586-753-3866, or you may contact me.

Sincerely,

Roger Eberhardt, Acting Deputy Director
Office of the Great Lakes
517-284-5035

Enclosures
cc/enc: Mr. Dave Cowgill, USEPA
Mr. John Perrecone, USEPA
Ms. Rose Ellison, USEPA
Mr. Jon W. Allan, MDEQ
Mr. Rick Hobrla, MDEQ
Ms. Melanie Foose, MDEQ

Removal Recommendation
Degradation of Benthos Beneficial Use Impairment
St. Clair River Area of Concern

Issue

Michigan Department of Environmental Quality (MDEQ), Office of the Great Lakes, Areas of Concern (AOC) program staff recommend the removal of the Degradation of Benthos Beneficial Use Impairment (BUI) for the St. Clair River AOC based on the review of relevant documentation pursuant to the process and criteria set forth in the *Guidance for Delisting Michigan's Great Lakes Areas of Concern* (*Guidance*) (MDEQ 2008). This recommendation is made with the support of staff from the United States Environmental Protection Agency (USEPA) Great Lakes National Program Office, the MDEQ Water Resources Division, and the St. Clair AOC Binational Public Advisory Council (BPAC).

Background

The St. Clair River AOC is a binational AOC, sharing a boundary with Canada. The boundary of the AOC includes the entire river from the Blue Water Bridge (connecting Sarnia and Port Huron) to the southern tip of Seaway Island, west to St. John's Marsh, and east to include the north shore of Mitchell's Bay on Lake St. Clair (Ontario Ministry of the Environment (OMOE) and MDNR 1991).

Six BUIs remain impaired on the United States (U.S.) side of the St. Clair AOC: Restrictions on Fish and Wildlife Consumption, Bird or Animal Deformities or Reproductive Problems, Degradation of Benthos, Restrictions on Drinking Water Consumption or Taste and Odor Problems, Beach Closings, and Loss of Fish and Wildlife Habitat.

Removal Criteria

According to the state's Guidance, the Degradation of Benthos BUI will be considered restored when:

- An assessment of benthic community, using either MDEQ's SWAS Procedure #51 for wadeable streams or MDEQ's pending rapid assessment procedure for non-wadeable rivers yields a score for the benthic metrics which meets the standards for aquatic life in any 2 successive monitoring cycles (as defined in the two procedures).

OR, in cases where MDEQ procedures are not applicable and benthic degradation is caused by contaminated sediments, this BUI will be considered restored when:

- All remedial actions for known contaminated sediment sites with degraded benthos are completed (except for minor repairs required during operation and maintenance) and monitored according to the approved plan for the site. Remedial actions and monitoring are conducted under authority of state and federal programs, such as the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund); Resource Conservation and Recovery Act; Great Lakes Legacy Act; or Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA).

The attached excerpt from the *Guidance* (pages 28-30) includes the rationale for the delisting criteria (Attachment A).

Since the *Guidance* was established, the MDEQ's pending rapid assessment procedure for non-wadeable rivers was finalized on February 6, 2013. The procedure is titled *Qualitative Biological and Habitat Survey Protocols for Non-wadeable Rivers*, or Procedure #22.

Historical Sources

At the time of the 1991 Remedial Action Plan, there were "56 point sources discharging into the St. Clair River and its tributaries from Michigan and Ontario. These include thermal electric generating stations; industrial facilities representing the organic chemicals, inorganic chemicals, petroleum refining, pulp and paper, and food processing sectors; and municipal wastewater treatment plants" (OMOE and MDNR 1991). These point sources were discharging to the river "either directly to the St. Clair River or indirectly via its tributaries" (OMOE and MDNR 1991).

Of the 56 point sources, "on the Michigan side, there [were] eleven major point source discharges within the AOC." Five of which were municipal wastewater treatment plants, and six were industrial sources, including Detroit Edison Co. plants at St. Clair, Marysville and Belle River; AZKO Salt, Inc. in St. Clair, James River KVP in Port Huron, and E.B. Eddy in Port Huron (OMOE and MDNR 1991). Currently, the same eleven major sources are still operating; with the exception of the Detroit Edison Co. power plant in Marysville which ceased operations in 2001 and was decommissioned in 2011 (Table 1).

Table 1. Major U.S. Point Source Discharges to the St. Clair River (OMOE and MDNR 1991).

Major Point Sources – 2013*	Major Point Sources – 1991^	Facility Location Address*
Cargill Inc. – Salt Division	AKZO Salt Inc. (Now Cargill Inc.)	916 South Riverside Avenue St. Clair, Michigan 48079
DTE – Belle River Power Plant	DTE – Belle River Power Plant	4505 King Road East China, Michigan 48054
DTE – Marysville Power Plant *(Ceased Operations in 2001, Decommissioned in 2011)*	DTE – Marysville Power Plant	301 Gratiot Boulevard Marysville, Michigan 48040
DTE – St. Clair Power Plant	DTE – St. Clair Power Plant	4901 Point Drive East China, Michigan 48054
Dunn Paper Inc.	James River KVP (Now Dunn Paper Inc.)	218 Riverview Street Port Huron, Michigan 48060
E.B. Eddy Paper Inc. – Domtar Corporation	E.B. Eddy Paper Inc.	1700 Washington Avenue Port Huron, Michigan 48060
Marine City Wastewater Treatment Plant	Marine City Wastewater Treatment Plant	1696 South Parker Street Marine City, Michigan 48039
Marysville Wastewater Treatment Plant	Marysville Wastewater Treatment Plant	980 East Huron Boulevard Marysville, Michigan 48040
Port Huron Wastewater Treatment Plant	Port Huron Wastewater Treatment Plant	100 Merchant Street Port Huron, Michigan 48060
Algonac Wastewater Treatment Plant	Algonac Wastewater Treatment Plant	451 State Street Algonac, Michigan 48001
St. Clair Wastewater Treatment Plant	St. Clair Wastewater Treatment Plant	300 Cedar Street St. Clair, Michigan 48079

* NMS Web Inquiry System *(The link provided was broken and has been removed.)*

"Most of the area's industry is concentrated within the industrial area between Sarnia and Corunna in Ontario" with "the most heavily contaminated portion of the river, as identified by the most frequent exceedences of dredged material disposal guidelines, by relatively high concentrations and by sediment toxicity, is the area within 100 m of the Ontario shore from the Cole Drain to downstream of Suncor" (OMOE and MDNR 1991). See Attachment F for a map of this area.

While the Michigan side of the river did not exhibit pristine conditions, the RAP states that, "in both 1968 and 1977, the [benthic] community along the Michigan shore was well-balanced (i.e. well-represented by pollution intolerant, facultative, and tolerant organisms), and was essentially unaltered spatially. Both the number of taxa and density of organisms was high. The community was not impaired" (OMOE and MDNR 1991).

The RAP further states that "benthic community health is good on the Michigan side of the river but, as of 1985, was impaired along the Ontario shore for a distance of about 12 km (7.4 mi) beginning in the reach between the Sarnia WPCP and Dow Chemical and extending downstream past Stag Island to approximately Novacor Chemical (Canada) at Mooretown" (OMOE and MDNR 1991).

In contrast, "severely degraded benthic communities… appear to be confined to the Sarnia industrial waterfront and a few kilometres downstream" (OMOE and MDNR 1991).

The conclusion in the Remedial Action Plan for the St. Clair River Area of Concern: Environmental Conditions and Problem Definition, was that there are no "known contaminated sediment sites with degraded benthos" that have been identified in need of clean-up on the U.S. side of the river"(OMOE and MDNR 1991).

Data Review

The state's *Guidance* contains two options for removal of the Degradation of Benthos Beneficial Use Impairment (BUI). The first tier allows for removal of the BUI following an assessment of the benthic community using either MDEQ's SWAS Procedure #51 for wadeable rivers or the MDEQ's Procedure #22 for non-wadeable rivers.

The St. Clair River is not considered a wadeable river; therefore Procedure #51 is not applicable. MDEQ's Procedure #22 for non-wadeable rivers was developed for inland "rivers where the mean annual discharge exceeds 530 cubic feet per second" (MDEQ 2013). In Michigan, 22 rivers have been identified as being within the scope of the non-wadeable procedure in both the upper and lower peninsulas. However, Procedure #22 is not applicable to the Great Lakes connecting channels, including the St. Clair, Detroit, and St. Marys rivers (MDEQ 2013). Rivers of these magnitudes were not considered in the development of the methods and metrics contained within Procedure #22 (K. Goodwin, personal communication, November 5, 2013).

Tier 2 of the Guidance can be used when either MDEQ's Procedure #51 or Procedure #22 is not applicable or when benthic degradation is caused by contaminated sediment. Utilizing this criterion, the BUI can be considered restored when all remedial actions for known contaminated sediment sites with degraded benthos have been completed.

In the St. Clair River AOC, because the nature of the river does not allow either Procedure #51 or Procedure #22 to be used, and since there were no known contaminated sediment sites, the MDEQ conducted a comprehensive review of all available data as an assessment of the Degradation of Benthos BUI on the U.S. side of the St. Clair River AOC. Fourteen studies and reports from the USEPA, United States Geological Survey, the US Army Corps of Engineers, OMOE, and other researchers were reviewed.

Where locational information was provided, the data from the available studies was collected and georeferenced to ensure all the information reviewed was from the U.S. side of the St. Clair River shoreline only. A series of maps was created using the data, and these maps are available in Attachment E.

The data was then evaluated using the Sediment Quality Triad (SQT) approach. "The Sediment Quality Triad, developed in the mid-1980s, is now widely used for conducting integrated assessments of sediment quality based on measures of chemistry, toxicity and benthos" (Chapman et al. 1997). That is, the sediment chemistry data, together with the information on sediment toxicity studies and data on the macroinvertebrate communities observed in the St. Clair River, provide a comprehensive assessment of the quality of the benthos throughout the U.S. side of the St. Clair River.

Use of the "triad is recommended for sediment quality assessments designed to determine: 1. the existence and extent of benthic ecosystem degradation, and, 2. the cause(s) of that degradation, including specifically chemical contamination. If the appropriate tools are used in the Triad approach, users can identify those contaminants which have the strongest associations with toxicity and benthic effects and those that may not immediately appear to be of concern (Chapman et al. 1997)." Looking at the available data on the St. Clair River using this framework provided the best possible evaluation to determine the health of the benthos as a whole.

Sediment Chemistry Component

The sediment data was reviewed utilizing the methodology established by MacDonald *et. al.* (2000) in his paper, "*Development and Evaluation of Consensus-Based Sediment Quality Guidelines for Freshwater Ecosystems*." This methodology standardized sediment quality guidelines (SQGs) for "28 chemicals of concern in freshwater sediments (i.e., metals, polycyclic aromatic hydrocarbons, polychlorinated biphenyls, and pesticides)" (MacDonald et al. 2000). For each contaminant of concern, two SQGs were developed, Threshold Effect Concentration (TEC) and Probable Effect Concentration (PEC). TEC is the level "below which adverse effects are not expected to occur" and PEC is the level "above which adverse effects are expected to occur more often than not" (MacDonald et al. 2000).

Evaluating the sediment data using the established TECs and PECs provides "a reliable basis for classifying sediments as not toxic and toxic" in freshwater ecosystems (MacDonald et al. 2000).

As expected in a heavily used shipping channel with areas of concentrated industrial development, the presence of contaminants such as oil and grease, heavy metals, PCBs and PAHs were detected in some samples. The majority of data reviewed showed the levels of contaminants to be below TEC; however, there were a few samples which had values above TEC for Arsenic, Cadmium, Copper, Nickel, Anthracene, Phenanthrene, and Pyrene. There were no samples which exceeded PEC values.

Sediment Toxicity Component

The second component of the Sediment Quality Triad (SQT) is the evaluation of the toxicity of sediments. A sediment toxicity test, conducted in a laboratory setting, is used to determine whether the sediments are potentially harmful to aquatic organisms.

The studies available for the Michigan side of the St. Clair River involved testing on four types of aquatic organisms including *Tubifex tubifex* (Segmented Worms), *Chironomus riparius* (Midge), *Pimephales promelas* (Fathead Minnow), and *Hexagenia spp.* (Mayfly).

P. promelas are used for the evaluation of acute and chronic toxicity of contaminants to vertebrates. For evaluation of toxicity of contaminants to macroinvertebrates, *T. tubifex*, *C. riparius*, and *Hexagenia* spp. were used. *T. tubifex* are tolerant of low oxygen conditions, sediments contaminated with heavy metals and other degraded environmental conditions. Likewise, the *Chironomids* are also tolerant of low oxygen conditions and polluted habitats. Conversely, species in the genus *Hexagenia* are predictors of good water quality as they are intolerant to polluted environments.

The toxicity tests on these benthic organisms have shown high survival rates, at 100% in 48 hour and 4 day tests; rates above 90% for 10 day tests (USACOE 1995); and good survival rates, near 100%, with minor reductions in growth and reproduction in *Hexagenia* spp. at *T. tubifex*, respectively (Moran and Zajdlik 1999).

Benthos (Macroinvertebrate Community) Component

The third component of the triad includes study and observation of the resident macroinvertebrate communities. Benthic macroinvertebrates are used as indicators of environmental quality for a variety of reasons. They are valuable as an assessment tool because they "are continuously subjected to the full rigor of the local environment throughout their aquatic life-cycle," and they "reflect past (historical) as well as present environmental conditions of a site" (Griffiths 1991). Therefore, they represent and allow us to measure "the effects of environmental stresses on aquatic systems, regardless of the frequency or intensity" (Griffiths 1991) of those stressors.

In one of the earliest studies, Thornley observed the macroinvertebrate community on the U.S. side of the St. Clair River, concluding "in both 1968 and 1977, the [benthic] community along the Michigan shore was well-balanced (i.e. represented by pollution intolerant, facultative, and tolerant organisms), and was essentially unaltered spatially. Both the number of taxa and density of organisms were high. The community was not impaired" (Thornley 1985).

Subsequently, in 1985, Griffiths conducted a study on both sides of the river to assess the distribution of benthic macroinvertebrates. Throughout the river, seven distinct community types were identified and named Communities 1 through 7. The structure of communities 5, 6 and 7 suggested higher concentrations "of sediment contaminants, e.g. metals, oils and greases, organic matter" (Griffiths 1991). None of these pollution stressed communities were found on the U.S. side of the St. Clair River but were confined to the Canadian side of the river, concentrated around Sarnia.

The communities, 1 through 4, found throughout the "remainder of the St. Clair River were considered to be typical of that of a large, unstressed river." These macroinvertebrate communities observed in most of the river, including all samples along the U.S. shoreline, "simply reflected the physical attributes of the habitat" (Griffiths 1991).

In 1999, Moran conducted a macroinvertebrate community study to compare American reference locations to other locations throughout the St. Clair River. Within the American reference locations, contamination above the TEC concentrations was found for Arsenic, Cadmium, and Nickel, as well as for the PAH's Phenanthrene, Anthracene and Pyrene, with no concentrations above PEC. Moran goes on to state that even though "the sediment conditions were not necessarily pristine, no dramatic improvement in the benthic community would be expected unless the overall St. Clair River conditions were altered" (Moran and Zajdlik 1999).

Although there were areas identified as having degraded benthic communities, overall, the data suggests a majority of healthy benthic macroinvertebrate communities. The benthic health along the U.S. side of the St. Clair River is generally good, and "given the host of other influencing physical, chemical and biological factors that define the general characteristics of the overall St. Clair River ecosystem" (Moran and Zajdlik 1999), no further improvement in the benthic community structure can be expected.

Conclusion

When using the SQT approach, examining the sediment chemistry data, the sediment toxicity data, and the macroinvertebrate community data available in a holistic manner, we find that although the benthos on the U.S. side of the St. Clair River is not pristine, no sites have been identified at levels which would require sediment remediation or further sediment characterization.

From the standpoint of sediment chemistry, no sediment samples were found on the U.S. side of the river above the PEC, and only a minority of samples were between the TEC and PEC.

Likewise, laboratory tests using sediments from the U.S. side of the St. Clair River provided evidence to support the conclusion offered using the sediment chemistry data. Sediment toxicity tests showed high survival, reproduction, and growth for four species of macroinvertebrates and one vertebrate species suggesting the sediments are not toxic.

Finally, the evaluations of existing macroinvertebrate community structure along the U.S. side of the St. Clair River showed generally good benthic health and stable communities given the available habitat. The established benthic macroinvertebrate communities, while not unharmed from years of municipal and industrial pollution, "is likely the best achievable condition given the level of urbanization or shoreline channelization that has occurred on both sides of the St. Clair River" (Moran 1999).

Based on all data reviewed, there is little evidence to challenge the assessment made in the 1991 Remedial Action Plan (RAP) that "benthic community health along the Michigan shore is good" (OMOE and MDNR 1991).

It is important to note that both the provincial and federal Canadian agencies are working in partnership with local stakeholders and are in the process of finalizing a plan for remediation of contaminated sites identified along the shoreline near Sarnia, Ontario. The remedial actions described under this plan are expected to be implemented by 2017 with engineering design and environmental assessment beginning in 2014.

This removal recommendation was discussed with the St. Clair River BPAC at their regular meeting on March 25, 2014. The St. Clair River BPAC submitted a formal letter of support for removal of the BUI, dated August 5, 2014, (Attachment C). The removal recommendation was also discussed at the Four Party Managers Meeting on June 24, 2014. The proposed action was public noticed via listing in the MDEQ Calendar. Supporting documents were posted on the MDEQ's AOC program web page for public review and comment from August 25, 2014, through September 8, 2014. No written or verbal comments were received during this period.

Recommendation

Based on the review of all pertinent data processed utilizing the SQT methodology, there continues to be no evidence of sediment contamination significant enough to degrade the benthos and thus requiring further sediment characterization or sediment remediation on the U.S. side of the St. Clair River.

MDEQ, AOC Program staff request approval of the recommendation to remove the Degradation of Benthos BUI from the St. Clair River AOC.

Prepared by: Melanie Foose, St. Clair River AOC Coordinator
Great Lakes Management Unit
Office of the Great Lakes
Michigan Department of Environmental Quality
September 11, 2014

Attachments

A – Degradation of Benthos, pages 28-30 of the Guidance for Delisting Michigan's Great Lakes AOCs

B – St. Clair River BPAC Meeting Minutes, March 25, 2014

C – St. Clair River BPAC Letter of Support for the Removal of the Degradation of Benthos BUI

D – Sediment Chemistry Maps

E – Location Maps

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NMS Web Inquiry System *(The link provided was broken and has been removed.)*

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Attachment A

2008 Guidance for Delisting Michigan's Great Lakes Areas of Concern

Degradation of Benthos

Significance in Michigan's Areas of Concern

Thirteen AOCs in Michigan have identified Degradation of Benthos as a BUI (all except Deer Lake). This impairment usually results from the biologically-based effects of sediment contamination and is closely related to the restrictions on dredging impairment. This impairment deals with only the surficial layer of sediments where organisms live.

Michigan Restoration Criteria and Assessment

This BUI will be considered restored when:

- An assessment of benthic community, using either MDEQ's SWAS Procedure #51 for wadeable streams or MDEQ's pending rapid assessment procedure for non-wadeable rivers yields a score for the benthic metrics which meets the standards for aquatic life in any 2 successive monitoring cycles (as defined in the two procedures).

OR, in cases where MDEQ procedures are not applicable and benthic degradation is caused by contaminated sediments, this BUI will be considered restored when:

- All remedial actions for known contaminated sediment sites with degraded benthos are completed (except for minor repairs required during operation and maintenance) and monitored according to the approved plan for the site. Remedial actions and monitoring are conducted under authority of state and federal programs, such as the Comprehensive Environmental Response, Compensation, and Liability Act (Superfund), Resource Conservation and Recovery Act, Great Lakes Legacy Act, or Part 201, Environmental Remediation, of the Natural Resources and Environmental Protection Act, 1994 PA 451, as amended (NREPA) (Part 201).

Rationale

Practical Application in Michigan

The AOC program addresses the worst contaminated sites in the Great Lakes. Those AOCs that have degradation of benthos from sediment contamination have specific sites that are being remediated with regulatory programs. Once these specific sites have been remediated, the benthos in the AOC will no longer be among the worst in the Great Lakes, so the use impairment can be considered restored. The reasons for identifying degradation

of benthos varies across Michigan's AOCs. Benthos in some AOCs are degraded due to non-contaminated sediment deposition, or hydrologic changes in the waterbody. In other AOCs, benthos are degraded due to the effects of contaminated sediments.

The restoration criteria for Degradation of Benthos allows for two different approaches for evaluating restoration success. The first approach employs MDEQ procedures for evaluating benthic community structure in wadeable and non-wadeable streams. Rapid, qualitative biological assessments of wadeable streams and rivers are conducted using SWAS Procedure #51, which compares fish and benthic invertebrate communities at a site to the communities that are expected at an unimpacted, or reference site. This is a key tool used by MDEQ to determine whether waterbodies are attaining Michigan Water Quality Standards. However, this procedure cannot be used on non-wadeable rivers. The MDEQ has been partnering with Michigan State University to develop and validate a procedure for assessing aquatic communities in non-wadeable rivers that the State implemented beginning in 2006. If these procedures are applicable to an AOC, data collected under the monitoring program will be used to evaluate whether benthos has been restored according to the criteria. Where biological assessments are not applicable, the second approach will be used to determine removal of this BUI.

The second approach focuses on benthic degradation from chemical contamination. Contaminated sediments are the primary cause for benthic impairments in AOCs. Sediment remediation and assessment will be accomplished through established programs such as federal Superfund, Resource Conservation and Recovery Act, Great Lakes Legacy Act, and Michigan's Part 201. Criteria are site-specific and are usually based on sediment chemistry or sediment toxicity. In addition to dredging contaminated sediments for remediation, regulatory programs sometimes adopt natural attenuation as the method for addressing contaminated sediments. In both cases, when the final remedial measures are completed, and monitored according to site plans, the BUI will be considered restored. Removal of the BUI will not be contingent on full recovery of the benthic community, which may take many years or even decades.

1991 IJC General Delisting Guideline

When the benthic macroinvertebrate community structure does not significantly diverge from unimpacted control sites of comparable physical and chemical characteristics. Further, in the absence of community structure data, this use will be considered restored when toxicity of sediment-associated contaminants is not significantly higher than controls.

The IJC general delisting guideline for the BUI is presented here for reference. The Practical Application in Michigan subsection above describes application of specific criteria for restoration based on existing Michigan programs and authorities.

State of Michigan Programs/Authorities for Evaluating Restoration

Michigan conducts remedial actions on contaminated sediments under Part 201 and other state regulatory authority. The State also cooperates with federal programs that remediate contaminated sediments and restore benthos, such as the U.S. Superfund, the

Resource Conservation and Recovery Act, and the Great Lakes Legacy Act programs. In addition, the State has a permit program for dredging and filling of lakes, streams, and wetlands. Through these programs, biologically based effects of contamination could be determined as part of any assessment. Remediation, which addresses biological effects, occurs on a site-specific basis.

The MDEQ has benthic data from wadeable stream surveys (SWAS Procedure #51) gathered as part of the 5-year rotating basin monitoring in the state. In addition, the State will be starting a monitoring program for benthos in non-wadeable streams as part of the 5-year basin monitoring program beginning in 2006. Data from these surveys, as well as other relevant state monitoring data (e.g. MDNR surveys or special studies by DEQ for lake systems), will be used as applicable for monitoring and assessing restoration of this impairment.

In addition, the USEPA, Great Lakes National Program Office, and the U.S. Geological Survey are working together to identify procedures for developing delisting criteria for BUIs associated with contaminated sediments. The MDEQ will incorporate this guidance, as available and applicable, into the assessment of whether the State's restoration criteria for Degradation of Benthos BUI have been met in Michigan AOCs.

Some local AOC communities also have programs for monitoring water quality and related parameters which may be applicable to this BUI. If an AOC chooses to use local monitoring data for the assessment of BUI restoration, the data can be submitted to the MDEQ for review. If the MDEQ determines that the data appropriately address the restoration criteria and meet quality assurance and control requirements, they may be used to demonstrate restoration success.

Attachment B

St. Clair River BPAC Meeting Minutes

ST. CLAIR RIVER BI-NATIONAL PUBLIC ADVISORY COUNCIL

Draft Minutes
Meeting 2014 – 2

Tuesday, March 25, 2014
St. Clair County Building auditorium, 200 Grand River Ave.
Port Huron Michigan

ATTENDEES:

Fred Kemp	Christine Loeffler	Phil Vallance
Melanie Foose	Marina Plain	Rose Ellison
Kris Lee	Patty Troy	Paulette Duhaime
Craig Griffiths	Elizabeth Vang	Archie Kerr
Claude Lafrance	Ted Briggs	Kathy Watts
Darrell Randell	Dan Collins	Sherri Faust
Aimee Johnson	Frank Fisk	Lori Eschenburg
Don Brown		

REGRETS:
Judy Ogden, John Jackson, April White, Terry Burrell, Sheldon Parsons, Terry Richardson,

GUESTS:
Annette DeMaria - Environmental Consulting & Technology, Inc., Bruce A. Manny, USGS, D. Bigbee and J. Morris EA Engineering Science

Welcome and Introductions
The meeting was called to order at 6:30 p.m. by P. Troy. P. Troy noted that cards were available for members to sign to recognize the long and valuable service to BPAC for two members who decided to retire: Whitey Simon and Frank Schoonover. P. Troy will present them with the cards and a certificate of appreciation on behalf of all BPAC members.

Approval of Draft Agenda
Moved by Frank Frisk and seconded by Phil Vallance that the draft agenda be accepted as prepared with the following modification:
The River Walk item will be the first item on the agenda.
Dunn Paper Discharge will follow as the next item. P. Troy will facilitate a Power Point presentation prepared by Mr. McNutt, in his absence. All questions will be forwarded to Mr. McNutt for response.
A. Kerr will discuss the Asian Carp threat in new business

CARRIED

Approval of the Minutes from the meeting of January 14, 2014
Moved by Fred Kemp and seconded by Archie Kerr that the draft minutes of Tuesday, January 14, 2014 be accepted as prepared. *CARRIED*

River Walk – R. Maiers

R. Maiers provided an update on this project which rehabilitates one mile of shoreline of the St. Clair River from the Black River southward. The land was donated by Jim Acheson in 2011. Some of the most significant attributes of the project are: the shoreline will be completely accessible to the public, it is one of the longest stretches of rehabilitated shoreline on the US side of the river, it provides 0.75 acres of fish spawning habitat, it uses offshore reefs for fish habitat and protection from wave action, six million dollars has been expended of an estimated seven million dollar budget, it will be completed in about half of the time originally planned. A grand opening of the project is scheduled for June 7, 2014 and all members are invited. More details will be communicated as they become available. Additionally, it was noted that the Community Foundation added to the monies donated for a bench in memory of past US BPAC Co-chair Janice Littlefield to be placed on the RiverWalk near the "Outdoor Classroom." The bench with appropriate plaque will be installed this spring.

Dunn Paper Discharge – Scott McNutt

S. McNutt, Vice-President Technology was unavailable to present the update. Patty Troy agreed to facilitate showing the PowerPoint presentation on Mr. McNutt's behalf and forward any questions or comments from BPAC. A video clip integrated within the presentation did not function. The update reported good progress and improvements in controlling the discharge of filamentous bacteria slime using a biocide. The following questions and comments were posed:

- Although a significant reduction is reported, members were interested in knowing how large of a reduction was observed.
- What studies were done to determine the concentration of the biocide in the discharge and what monitoring is done to ensure that biocide and halogen concentrations are within prescribed MDEQ levels?
- What research in emerging control measures is being done to look for improved methods?
- What reports are being made to the regulator and is the regulator satisfied?
- How does MDEQ verify the veracity of the reports?
- Is a physical screen being considered to intercept the biofilm before it reaches the end of the discharge pipe?
- Concern was expressed that the problem was addressed by the company only following reports by the public of impact to the river. A suggestion was made that improved monitoring be in place to detect the issue prior to it impacting the river. Turbidity monitoring was suggested.

Action: Patty Troy will communicate questions on behalf of BPAC to S. McNutt of Dunn Paper and to Lishba Verughese, MDEQ.

Chrysler Beach - A. DeMaria, ECT

A. DeMaria represented the City of Marysville on the Chrysler Beach improvement project. She presented a Power Point document that featured a number of engineering

and biological solutions to the current beach and park configuration. There are stormwater outfalls at the park that drain about 25% of the surface area of the City. Recent track down of illicit connections and outfalls that contribute to poor E. coli beach sampling results were described for this $1.7 million improvement project. Three illicit connections were detected. It appears that errors were made during construction where sanitary sewers were connected to the storm sewer system. The City is planning to correct the problems. The project is expected to be completed by the spring of 2015.

PEAS and National Pollution Discharge Elimination System permitting update – M. Foose

Melanie Foose reported that MDEQ has effected very significant change in the past 18 months regarding PEAS. The system evolved state-wide from an answering service taking calls during off hours, to the service being used only as a backup for about 5% of the incoming calls. That percentage of calls will be reduced over time. Calls are now received from 8:00 am to 4:25 pm by MDEQ office staff; from 4:30 pm to 10:00 pm by MDEQ on-call staff and from 10:00 pm to 8:00 am by RAP line staff (MDNR).
BPAC recognized the important progress on the issue and repeated that the effective and uninterrupted operation of the service was a key factor in gaining the public's confidence in regard to addressing the drinking water bui. Members asked to receive a flow chart of the process, results of the effectiveness of the system in receiving, redirecting and responding to calls and the criteria used in call follow up. The members reinforced the value of an ongoing practice/simulation procedure. Members suggested that the new procedure should be communicated to water plant operators.
Action: M. Foose will report back to MDEQ staff responsible for the PEAS and circulate to BPAC the answers to the questions posed.
M. Foose reported that the Permit Chief of MDEQ acknowledged a backlog in permit processing and issuance due to retirements and vacancies. MDEQ is now actively managing the backlog and expects to all have backlog files completed by September 2014. Melanie reported that permitted facilities still had to meet all requirements of their original permit. M. Foose encouraged BPAC members to email her with any questions or concerns, which she would forward for response by appropriate staff. She added that the Permit Chief offered to attend a BPAC meeting to provide an update and respond to any questions.

MDEQ removal recommendation for the "Degradation of Benthos" BUI

A notice of motion was made at the November 2013 BPAC meeting to consider the removal of the degradation of benthos bui, based on the draft report produced by MDEQ. Concerns and questions were raised at that time by BPAC members. Members were to review the Draft removal recommendation and provide written feedback to Melanie Foose for modification of the document. A decision on the removal recommendation was to be considered at a future meeting. The report was revised, a question and answer document and a contaminated sediment glossary were prepared and distributed to BPAC for further input. Comments were received and further amendments were made to the documents.

Moved by Fred Kemp, seconded by Phil Vallance that the degradation of benthos beneficial use impairment be removed on the American side of the St. Clair River based on the revised MDEQ bui assessment document.
Concerns were expressed regarding the effects of recent paper plant effluent impacting the benthos and the status of the AOC following delisting. Additional changes were suggested on the question and answer document.
The vote was called and carried with one opposing vote. *CARRIED*

Muskrat Contaminant Evaluation - P. Troy
P. Troy reminded members that a Health Consultation memo prepared by the Michigan Department of Community Health on the public health risk of consuming muskrat muscle meat from the St. Clair River Area of Concern was distributed for BPAC consideration. This bui is expected to be proposed for removal and members were encouraged to study the reports in order to discuss the recommendation. An MDEQ staff report on the *Status of fish contaminant levels in the St. Clair River Area of Concern 2012* will also be distributed to members with the minutes of the meeting.

U.S. Habitat Designs – D. Bigbee and J. Morris
Hard copies of artist renditions of revised restoration plans for Cuttle Creek, Harsens Island and Cottrellville Township St. Clair River Shoreline were made available at the meeting. The plans were reviewed by the speakers. The revised restoration projects included good use of log/root wads, offshore breakwaters features, upland and in-water plantings, bottom reshaping and invasive plant control as appropriate. Plans will be completed this spring and construction will begin this year.

Committee Reports
i) Statewide Public Advisory Council
Members of the Council attended the AOC conference in Chicago during the week of March 17 – 21. PAC support grant applications are being prepared for submission. The grant submission will be for $20K to support BUI removal actions.
ii) Friends of the St Clair River
A meeting was held on March 5, 2014. Support was provided for large habitat restoration projects managed by the Lambton Stewardship of Chatham-Kent. The Friends are also preparing a new budget and grant submission for 201-15. The group will begin discussions on its role following delisting.
iii) Friends of the St. Clair River Watershed
Sheri Faust reported that the Friends are working on grant submissions to: research and develop brochures, handouts and coordinate public interest events. In particular, the second annual Sturgeon Festival will be expanded to offer 3 cruises in 2014 and involve school children. Friends will also be supporting the AOC St. Clair River symposium in September, 2014.
iv) BPAC Membership Committee
The committee chair position was vacated with the recent retirement of Whitey Simon. Volunteers were requested to fill the position. Archie Kerr offered his name to take on the role.

Moved by Kris Lee and seconded by Darrell Randell that Archie Kerr be considered to fill the position of chair of the membership committee. No other members were nominated. *CARRIED*
Archie Kerr accepted the position. He encouraged members from the US to join the committee to ensure representation and recruitment of members for all positions on BPAC from both sides of the border.

(v) Canadian RAP Implementation Committee (CRIC)
Phil Vallance reported that the CRIC last met January 30, 2014. Highlights of the meeting included CRIC's approval of the draft assessment report on the restrictions on dredging activities bui. The report recommended re-designating the bui to unimpaired. Following this approval, public and First Nation consultation will be undertaken, including a presentation to BPAC. April White reported that over $330K in funds for projects in the St. Clair River AOC were recommended for approval under the Great Lakes Sustainability Fund.

(vi) Four Agencies Managers Committee
Rose Ellison reported on the most recent 4 Agencies Managers meeting held in February. The managers discussed binational issues related to the new Great Lakes Water Quality Agreement (GLWQA) and the role of their group in respect to the new GLWQA appendices. It was suggested that the Near-shore Framework may address many of the binational issues dealt with by the 4 Agencies Managers group.

Other Business

- Archie Kerr suggested that BPAC take a pro-active approach on the very serious concern of invasion of Asian carp in the Great Lakes Watershed. He suggested that BPAC prepare a letter of support for the positions taken by US politicians who are promoting the separation of the Chicago Sanitary connection with the Mississippi River watershed.

Moved by Archie Kerr and seconded by Fred Kemp that BPAC send a letter of support for the position of Congresswoman Miller and other like-minded politicians, that immediate action be taken to plan and construct a permanent physical barrier to close the hydraulic connection between the Mississippi River watershed and the Great Lakes. *CARRIED*
Action: Archie Kerr, Fred Kemp and Judy Ogden will draft the letter for the signature of the Co-Chairs.

- Lori Eschenburg invited all to attend the official opening of the Blueways Water trail on May 10, 2014. It will be the first ever water trail in Michigan and has multiple handicap access launches. She invited members to access the Blueways website: http://www.bluewaysofstclair.org/ for further details.
- A question was asked about how an "Area of Concern in Recovery" is defined and how such a designation will be managed. A general definition was offered. However it was noted that this concept is still under development by officials of the responsible agencies for the GLWQA. Further information will be provided as the concept evolves.

- It was reported that the US Corps of Engineers will be overseeing a dredging project in the Black River. Approximately 33,000 cubic yards are expected to be dredged this summer.

Next Meeting
The next meeting of the BPAC was schedules for Tuesday, May 13, 2014 at 6:30 p.m. at the Sarnia Education Centre, 200 Wellington Street, Sarnia.

Adjournment
Moved by Terry Burrell and seconded by Darrell Randell that the meeting be adjourned. Motion carried.
The meeting was adjourned at 9:55 p.m.

Attachment C

St. Clair River BPAC Letter of Support

St. Clair River
BINATIONAL PUBLIC ADVISORY COUNCIL

August 5, 2014

Mr. Rick Hobrla
Office of the Great Lakes
Michigan Department of Environmental Quality

Dear Rick,

At the March 25th meeting of the St. Clair River Binational Public Advisory Council the committee approved the removal of the degradation of benthos beneficial use impairment on the American side of the St. Clair River based on the revised MDEQ BUI assessment document. I am attaching the minutes from that meeting which record this action.

Thanks to you and your staff, especially the SCR RAP coordinator Melanie Foose and also Sam Noffke, for the efforts to review reports and prepare the assessment document.

Best regards,

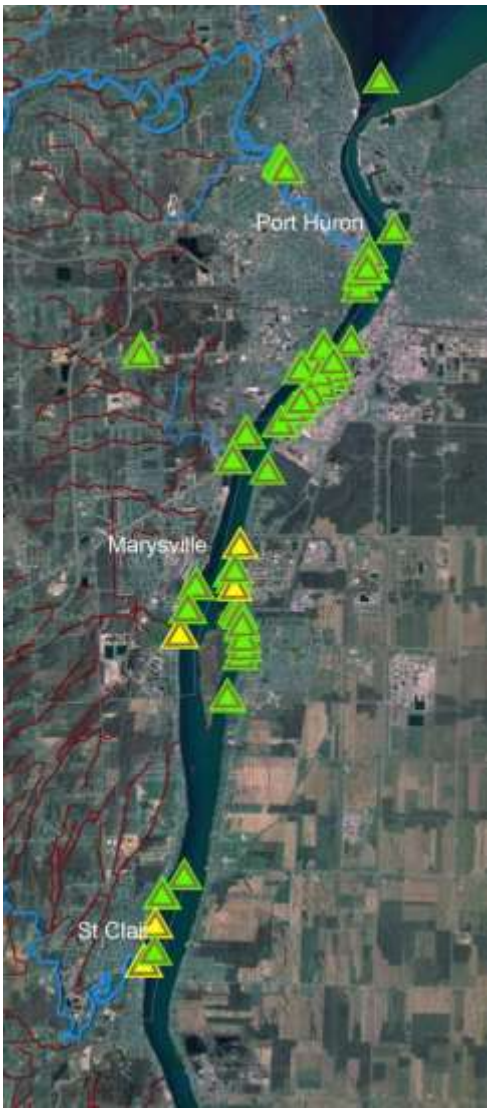
Patty Troy

Patty Troy
US Co-chair
St. Clair River BPAC

Attachment D:

Sediment Chemistry Maps

Map 1: Arsenic in the Upper St. Clair River

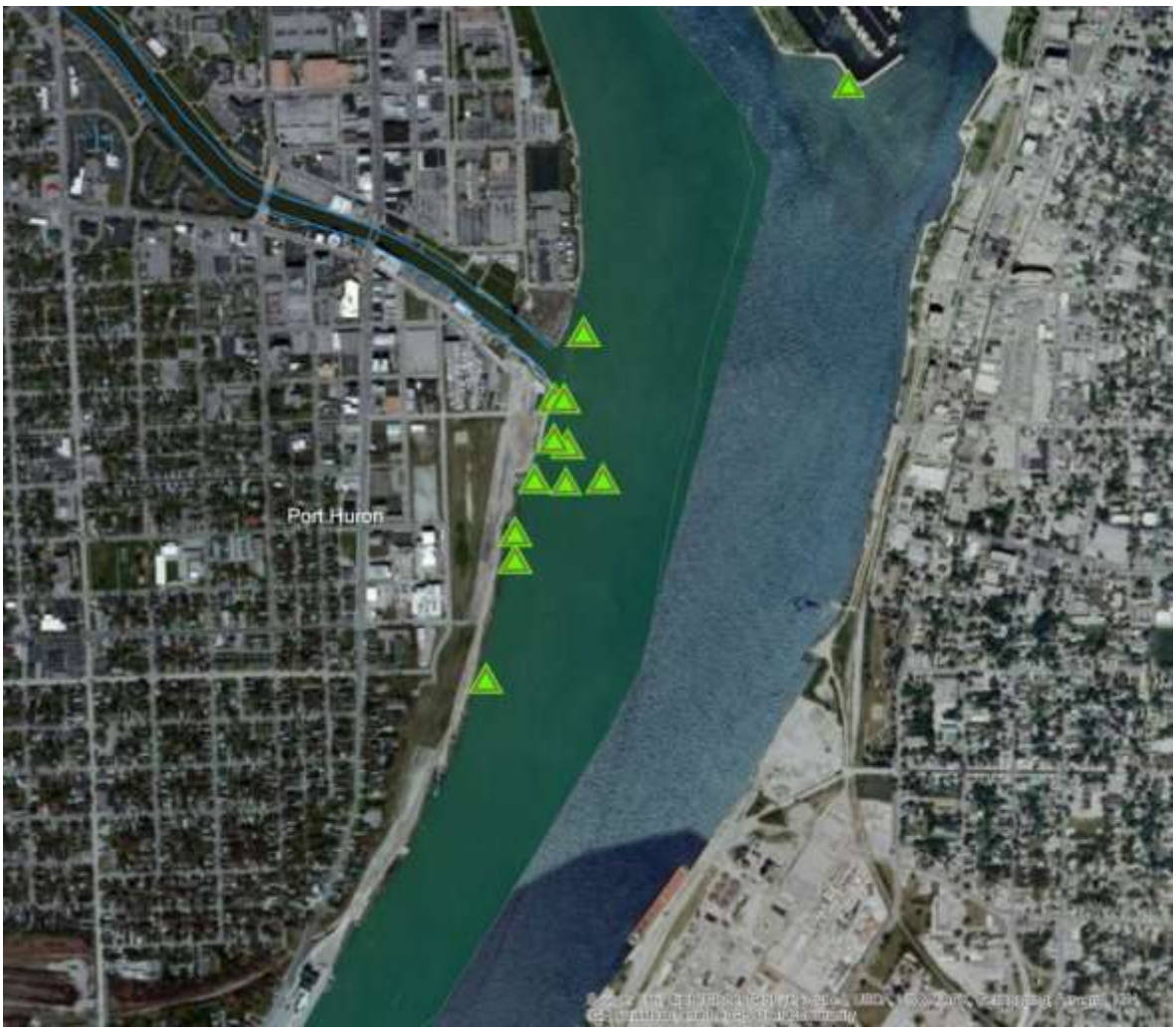


Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 2: Arsenic in the Lower St. Clair River

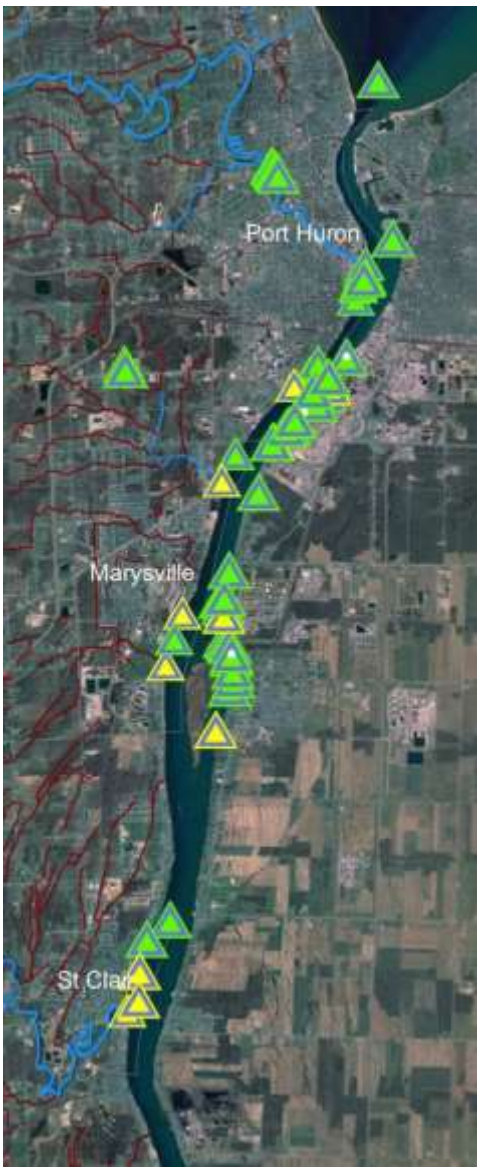
Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 3: Arsenic at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 4: Cadmium in the Upper St. Clair River

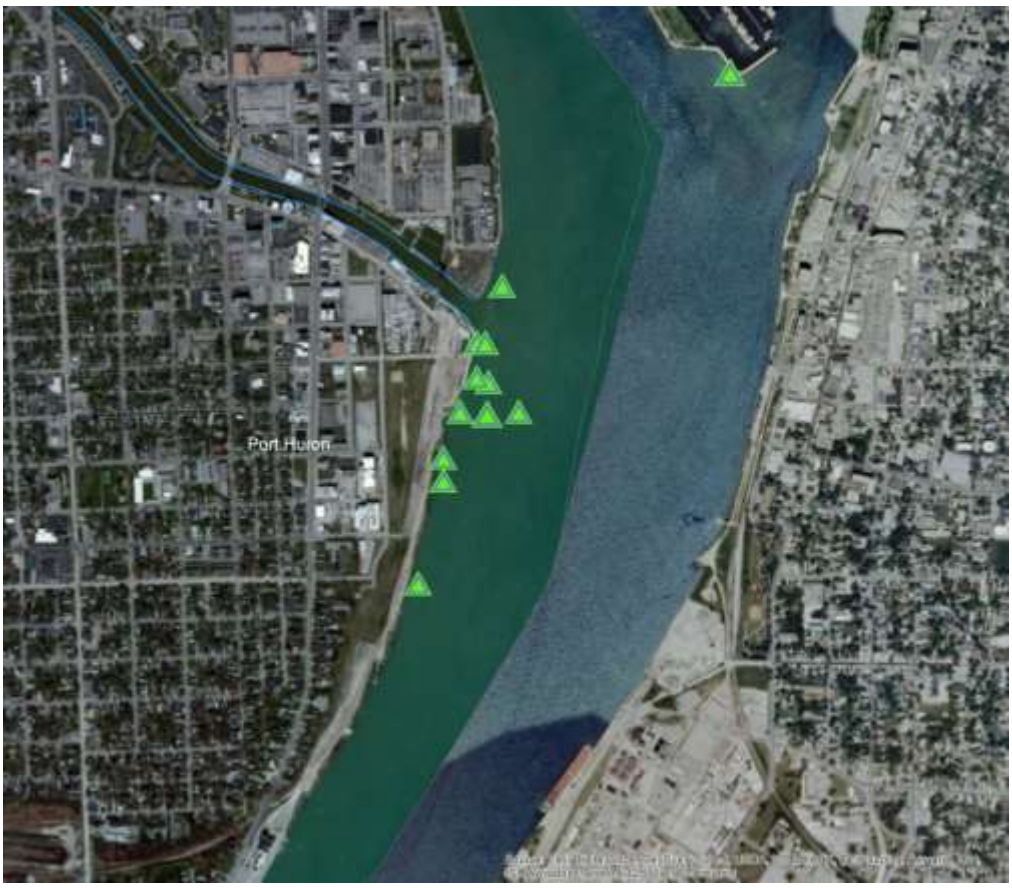


Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 5: Cadmium in the Lower St. Clair River

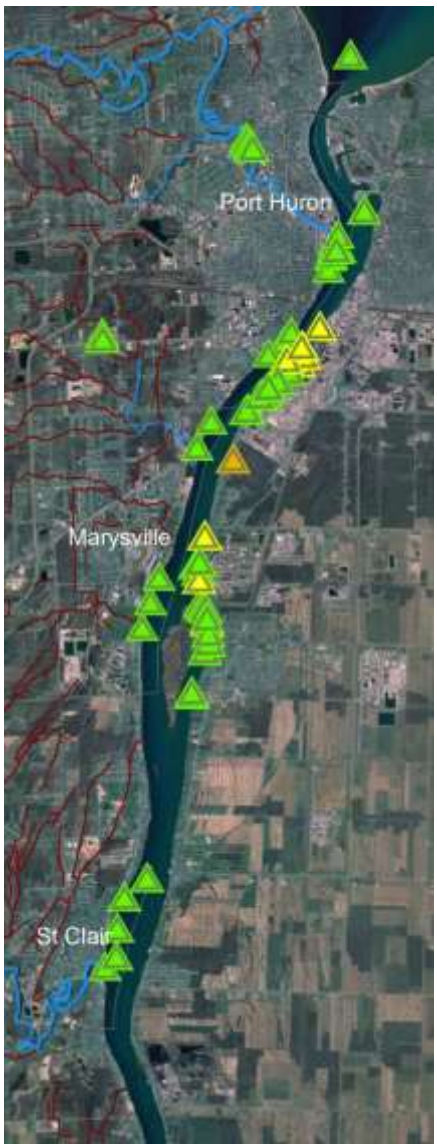
Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 6: Cadmium at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 7: Copper in the Upper St. Clair River

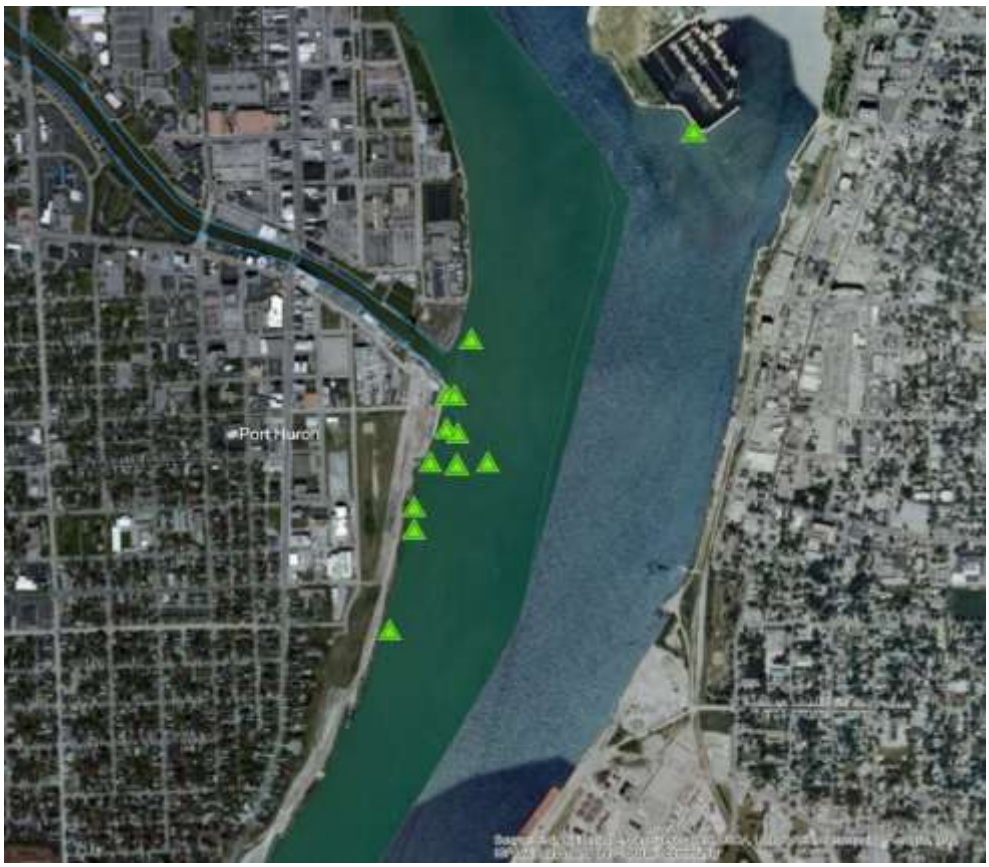


Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 8: Copper in the Lower St. Clair River

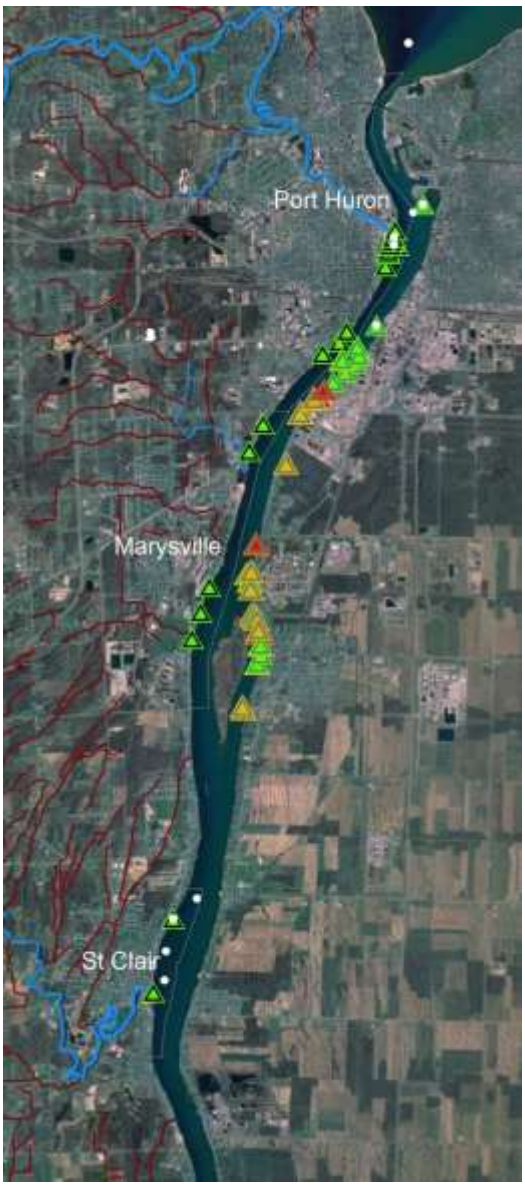
Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 9: Copper at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 10: Mercury in the Upper St. Clair River

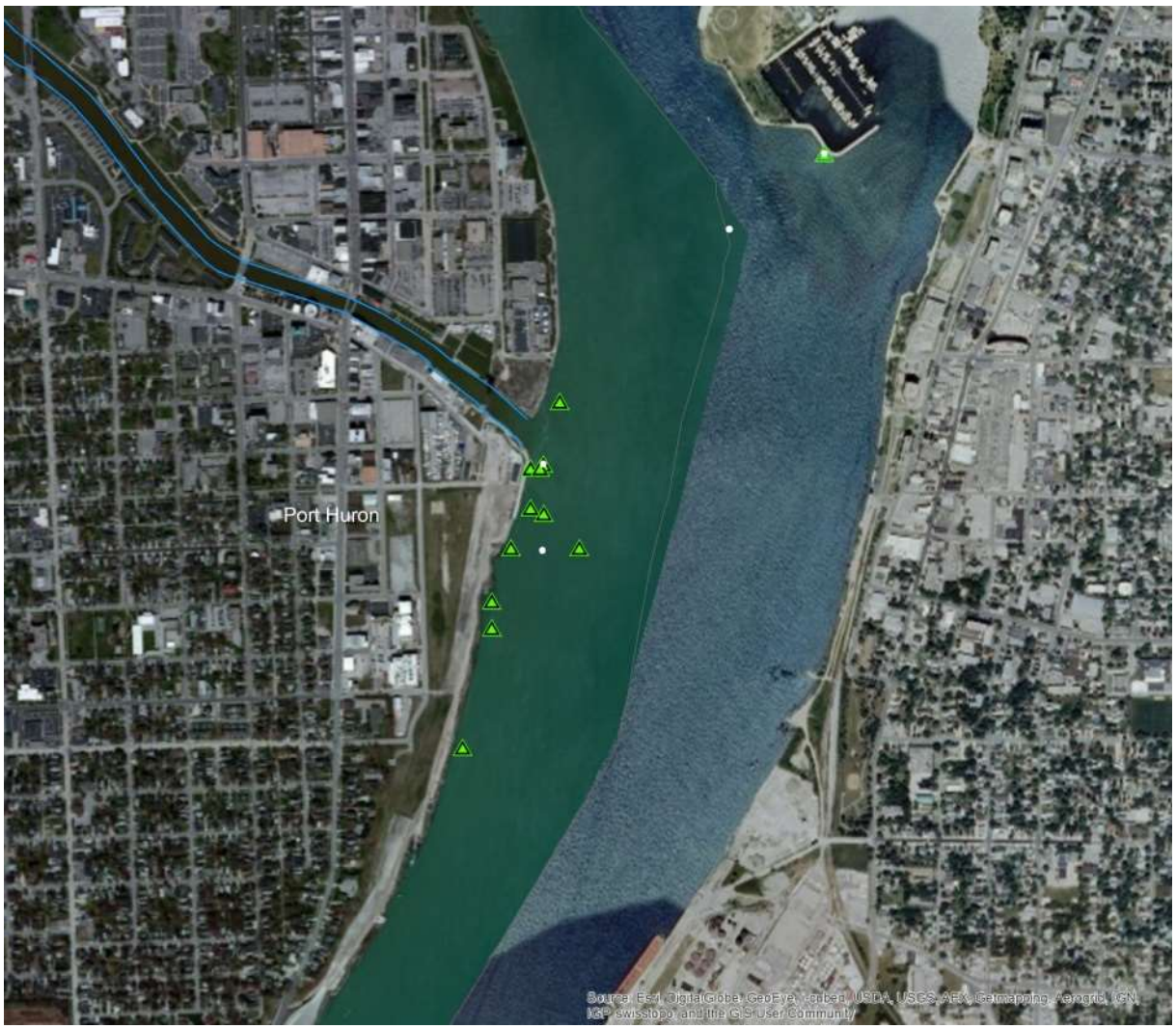


Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 11: Mercury in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 12: Close up of Mercury at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 13: Mercury in the Delta of the St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

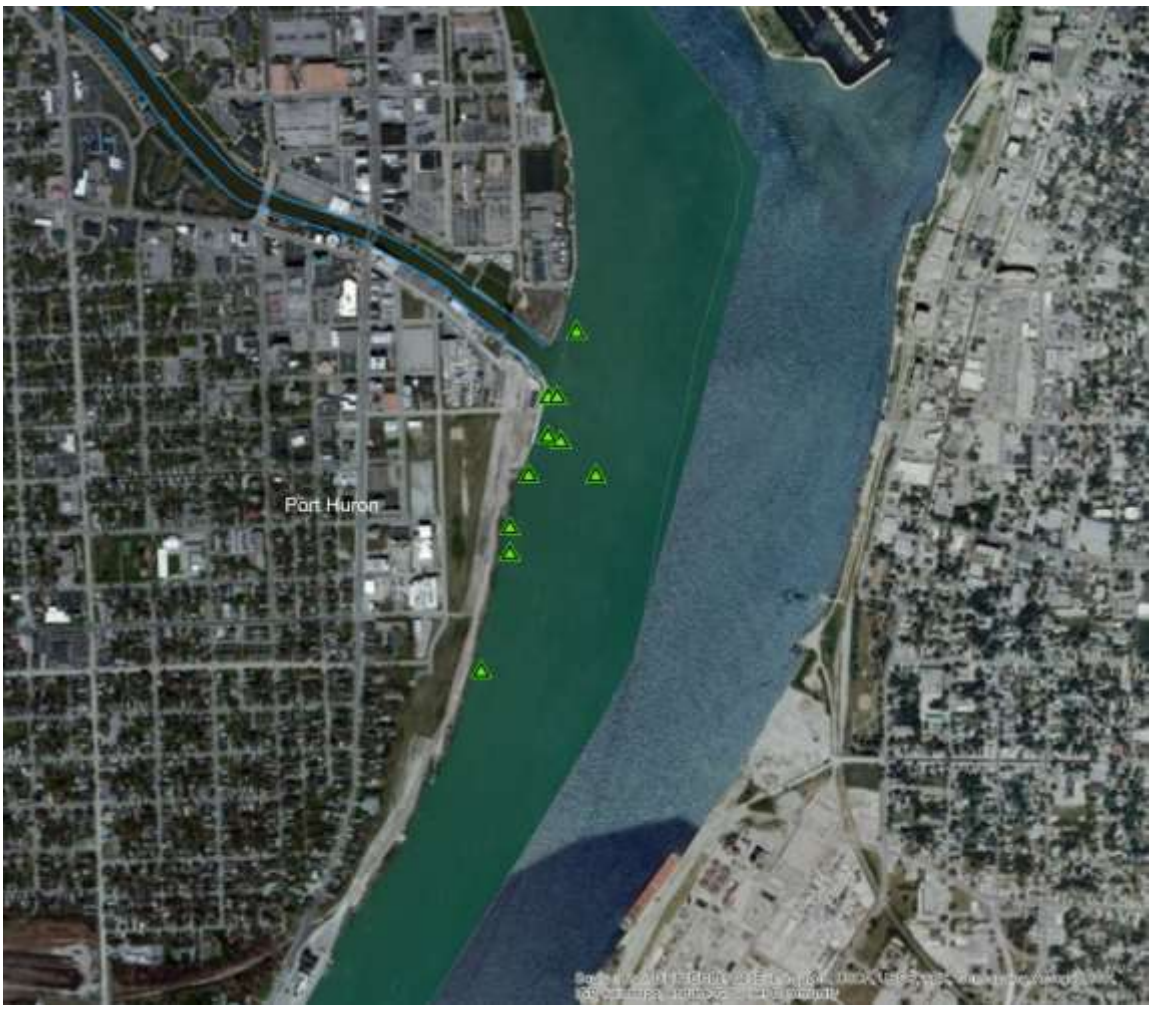
Map 14: Nickel in the Upper St. Clair River AOC

Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 15: Nickel in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 16: Close up of Nickel at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC

Map 17: PCBs in the Upper St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 18: PCBs in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 19: PCBs in the Delta of the St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

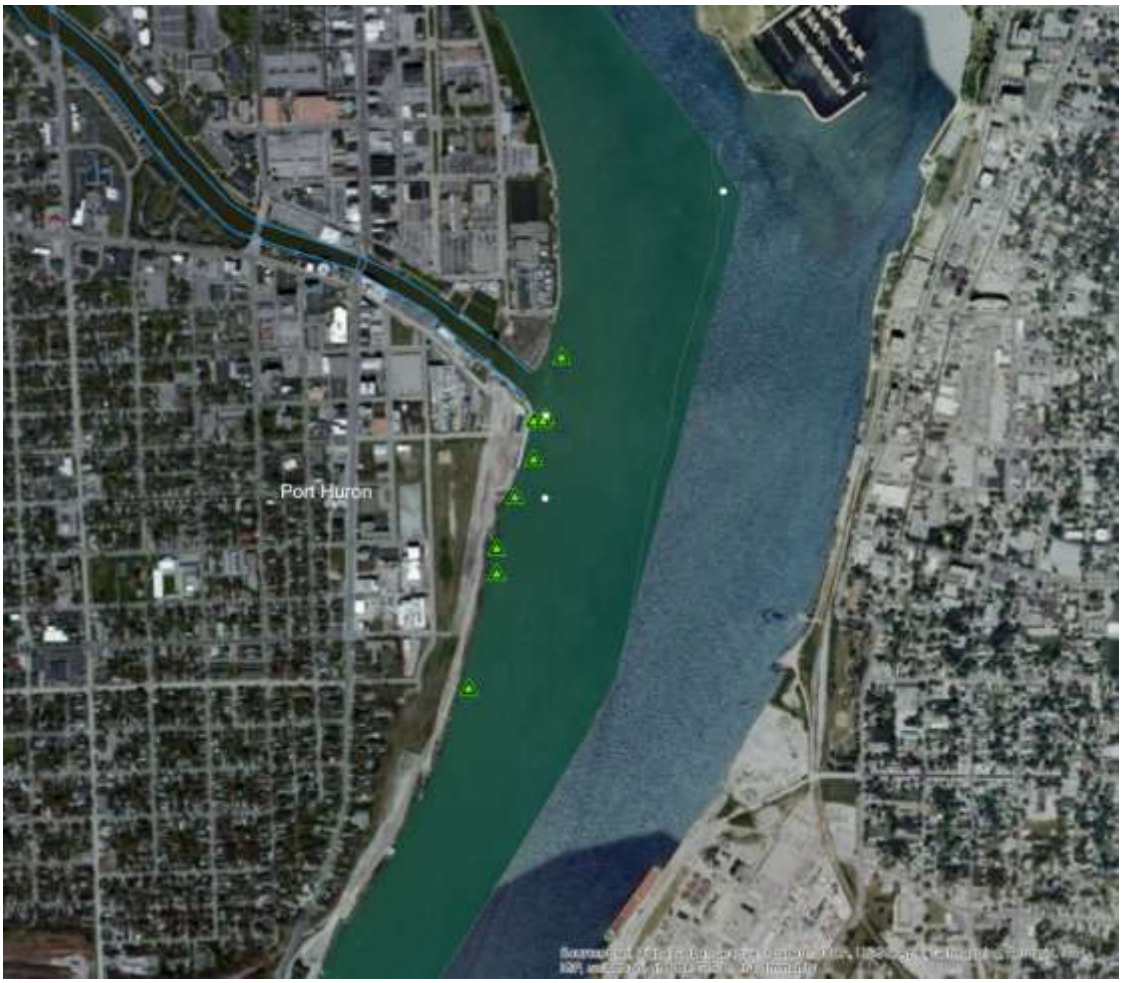
Map 20: Pyrene in the Upper St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 21: Pyrene in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 22: Pyrene at the Outlet of the Black River



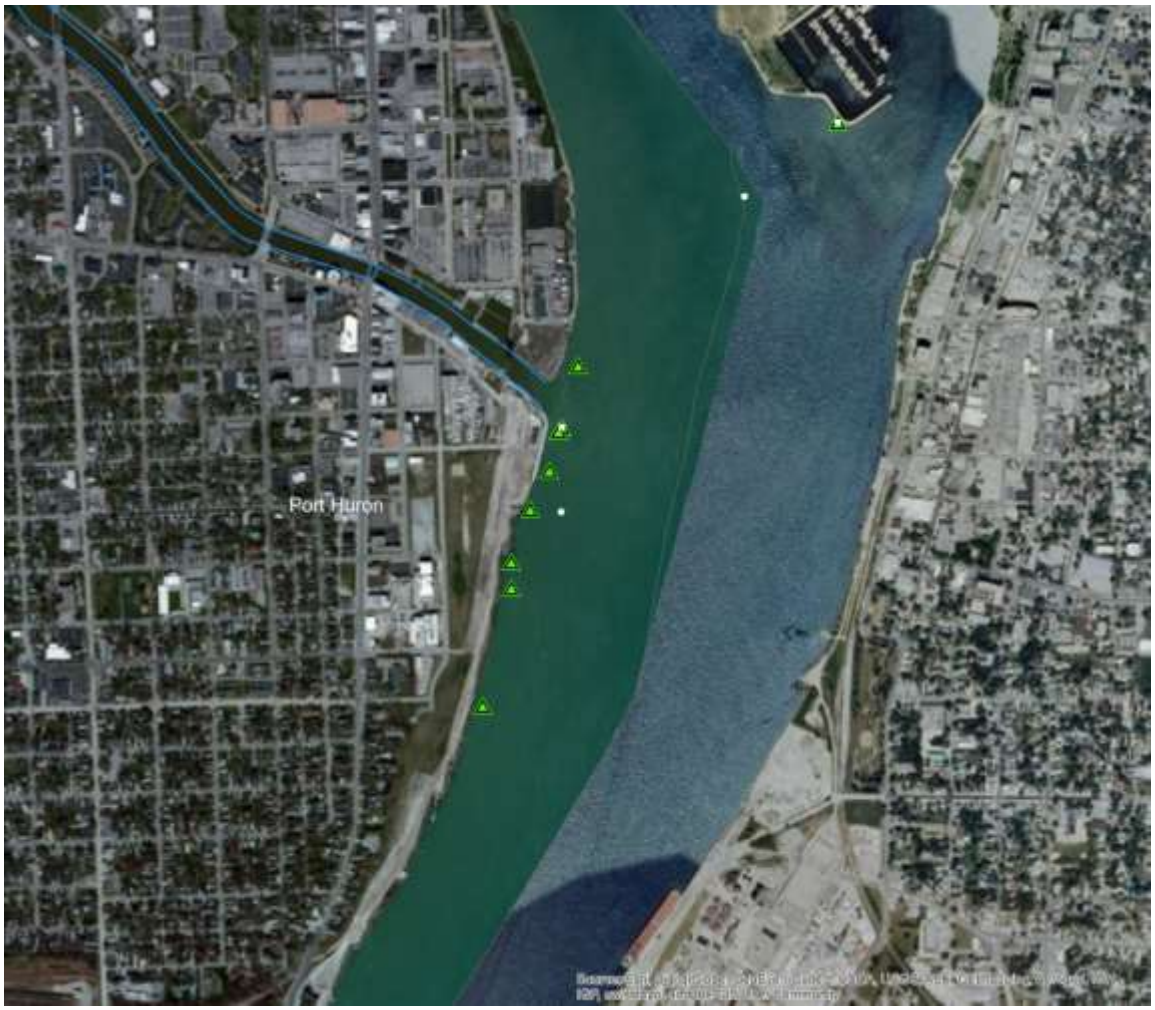
Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 23: Anthracene in the Upper St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Note: Anthracene was not detected downstream of this map.

Map 24: Anthracene at the Outlet of the Black River



Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 25: Anthracene in the St. Clair Delta

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

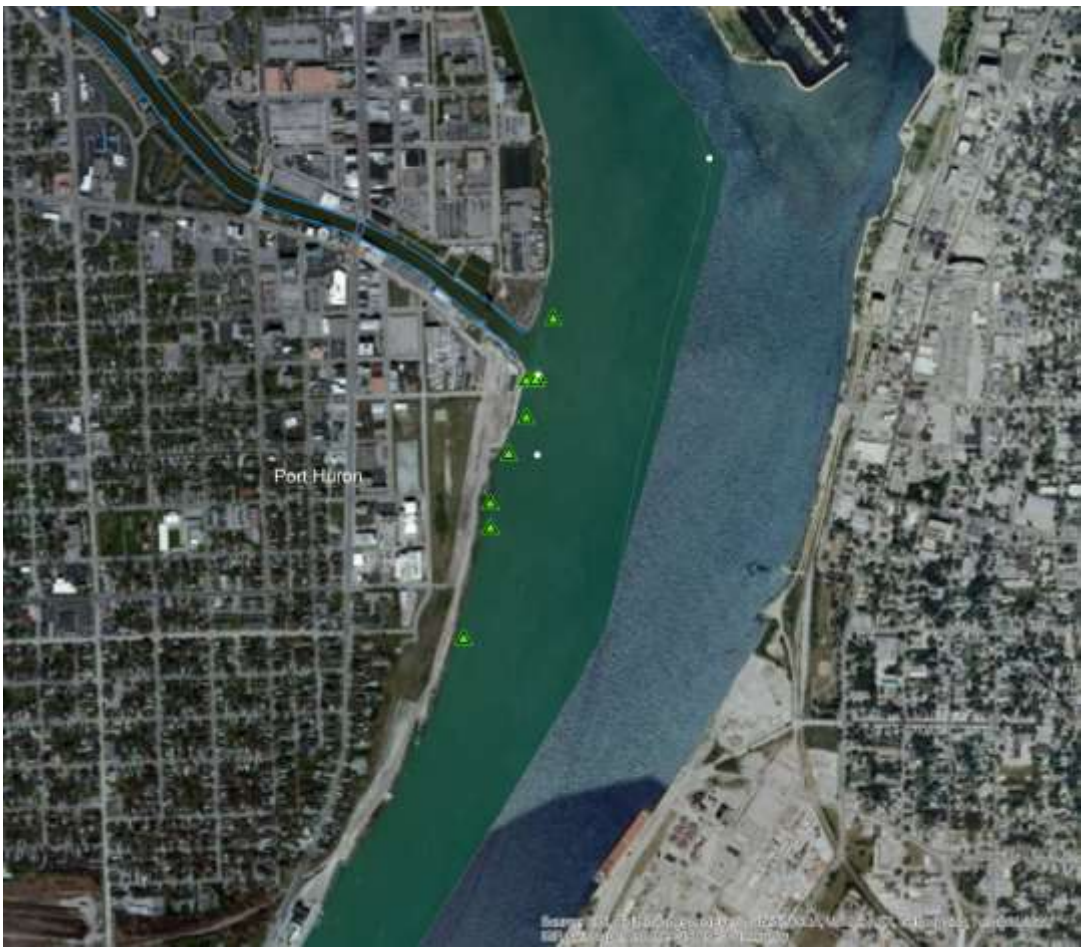
Map 26: Phenanthrene in the Upper St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 27: Phenanthrene in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 28: Phenanthrene at the Outlet of the Black River

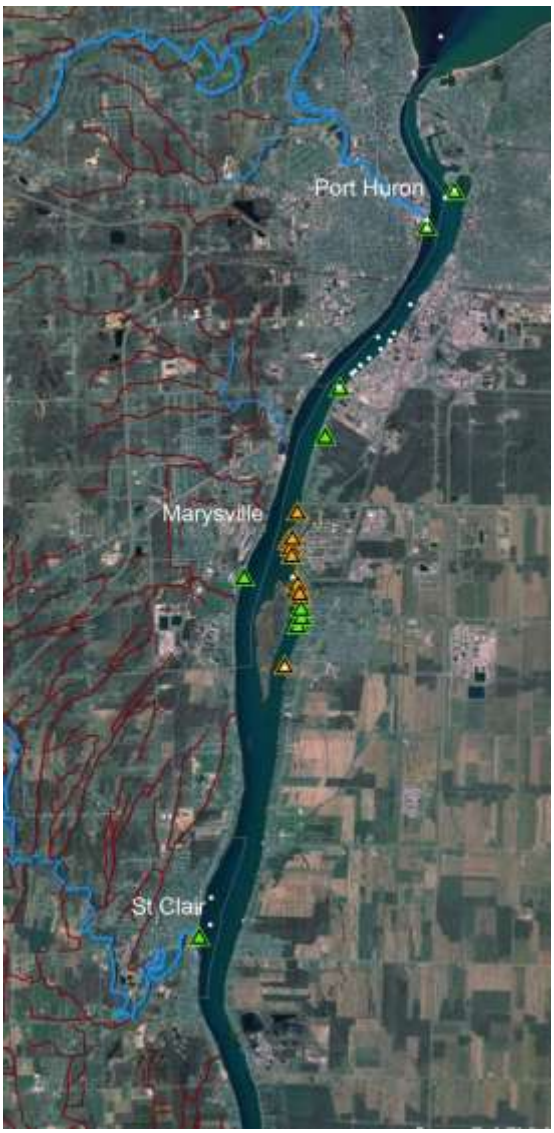


Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 29: Phenanthrene in the Delta of the St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 30: Pesticides in the Upper St. Clair River



Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 31: Pesticides in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 32: Total PAH in the Upper St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 33: Total PAH in the Lower St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Map 34: Total PAH in the Delta of the St. Clair River

Below TEC
Between TEC and PEC
Above PEC
10X PEC
Not Detected

Attachment E:

Location Maps

Figure 1: St. Clair River AOC Boundary

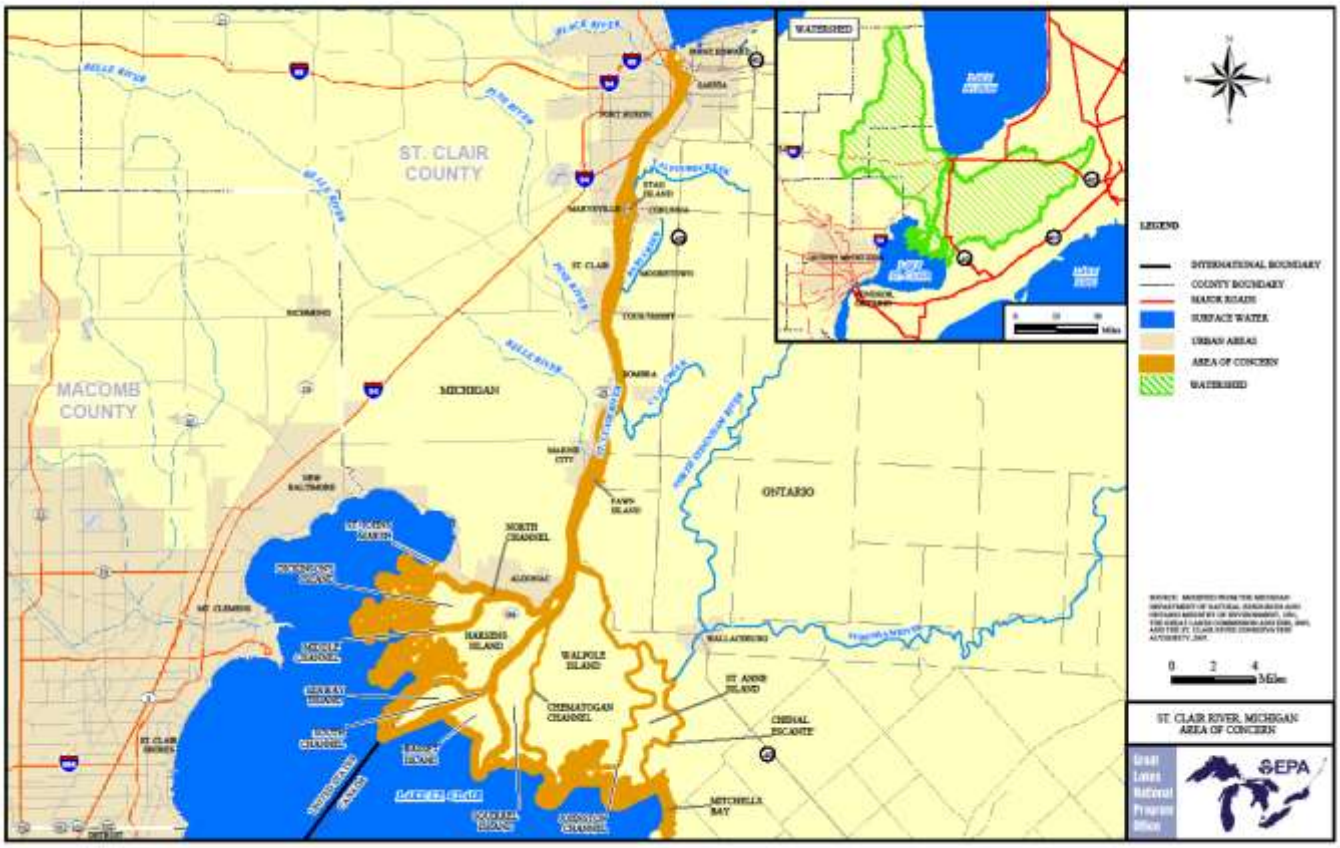


Figure 2: Location Map of the St. Clair AOC (OMOE and MDNR, 1991)

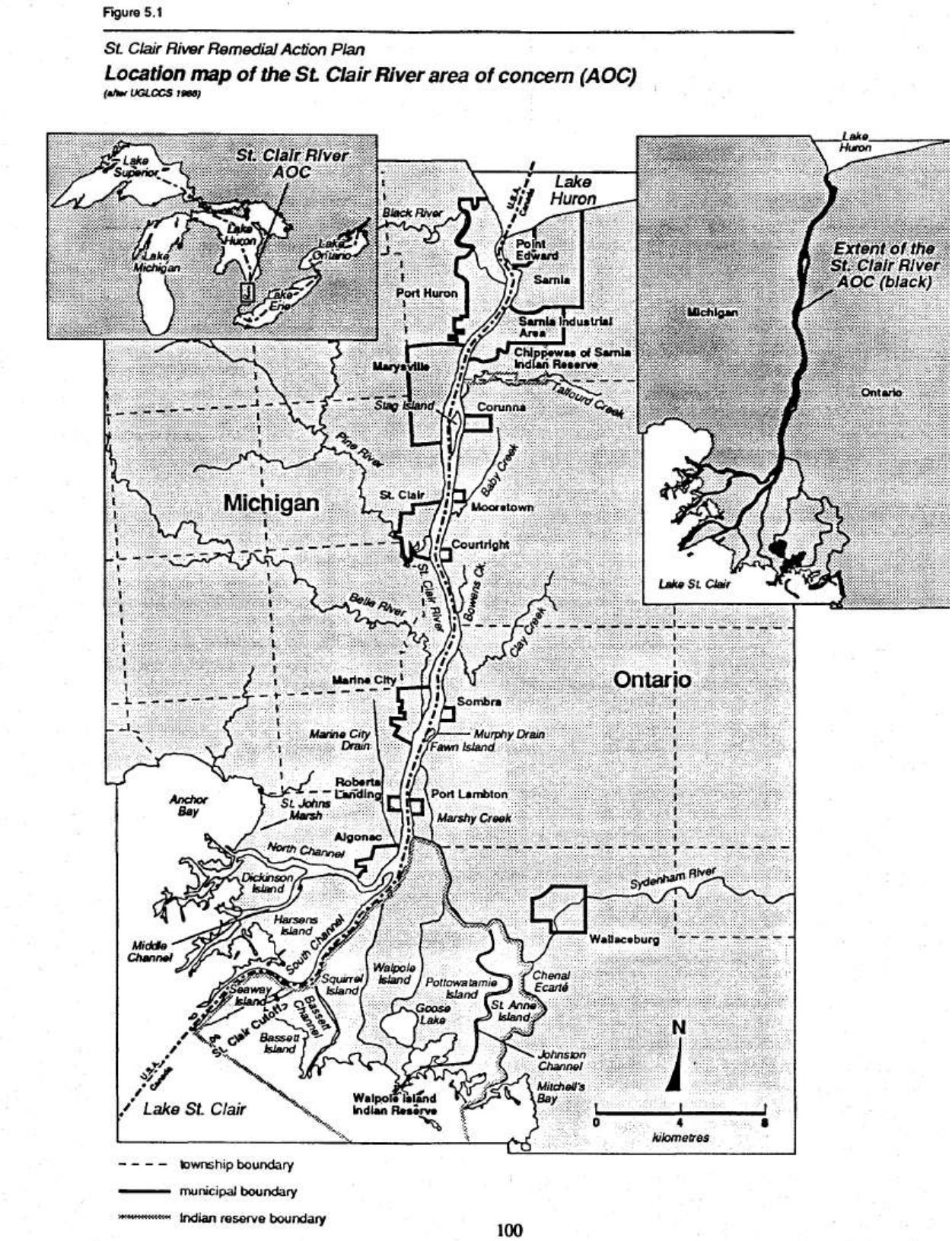


Figure 3: Map of Sarnia Industry