Essex Region Conservation Authority

Essex Region Source Protection Committee Meeting Agenda

Meeting Date: Wednesday, November 13, 2024

Time: 4:00 pm

Location and Details: Essex Civic Centre, Room E

List of Business **Page Number**

1. Land Acknowledgement

2. Call to Order

3. Chair's Welcome

4. Declarations of Conflict of Interest

5. Approval of Agenda **1-3**

THAT the agenda for the Wednesday, November 13, 2024 meeting of the Essex Region Source Protection Committee (SPC) be approved.

6. Adoption of Minutes

A. Essex Region Source Protection Committee (SPC) **4-10**

2024-03-13 Meeting Minutes

THAT the minutes of the Source Protection Committee meeting held on Wednesday, June 12, 2024 be approved as presented.

7. Correspondence

Letter from MECP, September 11, 2024. **11-15**

8. MECP Liaison's Update

9. Presentations

None.

10. Reports

A. SPC 07/24 **16-19**

Response to MECP Early Engagement - Policies

THAT the SPC receive SPC Report 07/24

B. SPC 08/24 **20-47**

Response to MECP Early Engagement - Microcystin

THAT the SPC provide direction on the identification of microcystin as a drinking water issue for the A.H. Weeks and Amherstburg drinking water intakes

C. SPC 09/24 **48-50**

Nest Steps – Assessment Report and Source Protection Plan for Early Engagement

THAT SPC Report 09/24 be received, and further;

THAT the SPC support the submission of Chapter 4 of the Assessment Report and Source Protection Plan to the MECP for Early Engagement

11. New Business

None.

12. Other Business

None.

13. Adjournment

THAT the November 13, 2024 meeting of the Essex Region Source Protection Committee be adjourned.

Next Meeting

The next meeting of the Essex Region Source Protection Committee is to be held on February 12, 2025.

Essex Region Source Protection Committee — Meeting Minutes

Meeting Date: Wednesday, June 12, 2024

Time: 4:00 pm

Location and Details: Essex Civic Centre, Room C

Attendance

Members Present:
Tom Fuerth (Chair)
Jason Barlow
John Barnett
Ron Barrette
Jim Drummond
Bill Dukes
Frank Garardo (proxy for Giofu)
Jenna Maidment
Matthew Merrett
Tim Mousseau (proxy for Ouellett)
Dennis Rogers (via Zoom)
Chris Snip
Kevin Webb (via Zoom)

Monica Lemke (MECP – via Zoom)
Monica Reid (ENWIN)
Dan Mustac (ENWIN)

Regrets: Antonietta Giofu, Cynthia Ouellett, Larry Verbeke

Staff Present: Katie Stammler, Water Quality Scientist/Project Manager Source Water Protection
Amy Weinz, Water Quality Technician

Others: Warren Higgins (via Zoom)

1. Call to Order

Good evening and welcome to the June 12, 2024 meeting of the Essex Region Source Protection Committee.

We have quorum with 11 members present, and 2 members present by Zoom. I will call the meeting to order at this time, 4:06 pm.

2. Land Acknowledgement

We would like to begin by acknowledging that this land is the traditional territory of the Three Fires Confederacy of First Nations, comprised of the Ojibway, the Odawa, and the Potawatomi Peoples. And specifically in the Essex region, we have the Caldwell First Nation. We respect the land and the moccasins that have walked on this land since time immemorial.

As we do at our meetings, I'll begin with a statement of gratitude and a statement of hope. As I look out at this very full room today, I'm very happy to see so many of you here in person, especially as this is the last wrap up of our policy amendment. It is a very exciting time for us before we submit.

3. Chair's Welcome

Last meeting, this committee encouraged Katie and me to visit municipalities and present our report to them and to encourage those who haven't entered the source protection plan into their planning documents to do so. We've met with 5 municipalities, City of Windsor, and the Towns of Amherstburg, LaSalle, and Essex and the Municipality of Leamington. Our presentations were well received. We have the other 4 municipalities in the region, Tecumseh, Kingsville, Lakeshore and Pelee, scheduled. We will be coming to them all with the Section 36 amendment so we've reintroduced them to the idea that source protection is something they need to be thinking about.

Dennis Rogers has been appointed to Board of Directors at ERCA, which means he's part of the Source Protection Authority. As a result, he will not be able to sit on the SPC as well. Union Water will have to nominate another member.

We have a new member selected to represent the Town of Lakeshore and we welcome Jason Barlow to the Committee. The official appointment of municipal members by the SPA will occur in the fall.

I want to welcome Jenna Maidment from Caldwell First Nations as well as Monica Lemke from MECP. We'll have an update from her shortly.

We'd also like to welcome Amy Weinz who is taking minutes and who has also been appointed our new Risk Management Official. This will take some of the work load off of Katie.

4. Declarations of Conflict of Interest

There were no declarations of conflict of interest.

5. Approval of Agenda

Resolution SPC 13/24 Moved by John Barnett
Seconded by Kevin Webb

That the agenda for the March 13, 2024 meeting of the Essex Region Source Protection Committee be approved.

Carried

6. Adoption of Minutes

A. Essex Region Source Protection Committee

Resolution SPC 14/24 Moved by Ron Barrette
Seconded by John Barnett

That the minutes for the March 13, 2024 meeting of the Essex Region Source Protection Committee (ERSPC) be approved and the recommendations therein be adopted as distributed.

Carried

B. Essex Region Source Protection Authority

2023-12-14 Meeting Minutes

Resolution SPC 15/24 Moved by Tim Mousseau
Seconded by Bill Dukes

THAT the minutes of the Essex Region Source Protection Authority meeting held on December 14, 2023 be received.

Carried

7. Correspondence

None.

8. MECP Liaison's Update

Last week Conservation Ontario hosted a meeting for the 19 project managers across Ontario to encourage relationship building and knowledge sharing among the project managers and ministry staff. As part of this meeting, we discussed trends, lessons learned and challenges regarding Section 34 and Section 36. The MECP also described its updates to the guidance document for these amendments. There are no major changes, but we are streamlining the process. The ministry has approved moving forward with three-year transfer payment agreements under the Drinking Water Source Protection Program, therefore providing some certainty in terms of budgeting for source protection authorities. While the Ministry funding envelope for the Drinking Water Source Protection Program has not increased, it will be held steady for the next three years.

9. Presentations

None.

10. Reports for Approval

A. **Report SPC 06/24** – S.36 Update – Remaining Miscellaneous Policy Updates

THAT the SPC approve the attached amended policies and those presented verbally at the meeting to be submitted to the MECP for early engagement

Resolution SPC 16/24 Moved by Matthew Merrett
Seconded by Chris Snip

Carried

11. New Business

None.

12. Other Business

Katie provided three updates to the SPC regarding funding for the program, and the consolidated linear infrastructure ECA process.

Funding for the Source Protection program is provided by the MECP to Source Protection Authority through transfer payment agreements (TPA). This round of funding is a three-year agreement for funding, which is great news. We applied in December 2023 and just received the draft agreement last week. We didn't have a lot of communication from the ministry in the interim and it's taking us a long time to understand how the information in our applications was transferred into our TPAs and where they made changes to our budgets. The MECP did give us an idea that there was going to be more money available. So, all of the SPAs all over-asked and then had to reduce our budgets.

Two main areas were cut – SPC budgets and Best Practices. SPC budgets were reduced by 10% because a lot of the other SPC meetings are not well attended, and that tends to be one of their biggest areas of being underspent. That problem does not exist with this Committee and we never have a problem with getting quorum. So, my budgets are usually pretty good on SPC, but made that cut across the board. Best Practices were developed to protect systems that are not municipal. It was going to be an eligible expense, but that was cut completely from all SPA budgets. We didn't have very much in our budget for that, so it wasn't really a big hit for us locally, but it is a big hit for some of the other regions. The seven largest regions are also taking a big cut to their administrative overhead costs and that's creating some challenges for them.

For my second update, I wanted to talk to about the consolidated linear infrastructure environmental compliance approval (CLI-ECA). As project managers and municipal staff, we have been trying to get our heads around it for a while. The idea behind it was to simplify the environmental compliance approval process for municipalities. Previously, any Works performed on sewers or stormwater would have an individual ECA. The idea now is to have a single ECA for municipal stormwater and a single ECA for municipal sanitary sewers, which sounds great in theory. But this has not been a very smooth process.

The CLI-ECA now includes source water section, which has been very challenging. The Ministry did provide a guidance document for how to incorporate source water, however it has proven to be more onerous for municipalities than it needs to be. The CLI-ECA is specifically for low risk systems that move sewage and is only meant to address specific sub-threats. But, in the guidance document, it includes several extra steps - use the source protection information atlas to find out if the Works are located in a vulnerable area; use the threats tool to find out what risks there are; check the local source protection plan for applicable policies. So, it's asking the municipalities to figure out whether these things are a threat, then to do what they call a threat assessment, which would indicate that they're supposed to find everything that's a threat there. At the Project Managers meeting the MECP, all PMs indicated that municipalities had asked

for their help and also that neither they nor their municipalities were clear on how to complete this part of the CLI-ECA. So it's not just the municipalities trying to figure out, it's also in the project managers trying to figure it out.

The town of Tecumseh reached out to me for support. We reviewed the requirements together and I connected with a risk management officials who had created a draft template. Together with the Town of Tecumseh, we used that template to create a streamlined local template. So, we've now got one main document for stormwater and one for sanitary sewers. The MECP is still reviewing the documents that we gave them, but the feedback we've received is positive. One of the sticking points was, what threats were supposed to be included in the CLI ECA for source water. As far as we can tell, it's just supposed to be sewage, which is what we're waiting on the Province to confirm because they've been going giving us different pieces of information on that and the concern the municipality originally came to us with was whether they were supposed to use the CLI-ECA to address all types of threat, like fuel storage. For most places in the Essex region, these sewage activities are not a significant drinking water threat. Basically, the assessment will say that there's no circumstances under which the activities are defined as a significant drinking water threat.

The last point in the CLI-ECA in the Source Water section states that, upon request, the owner shall make a copy of the report required available to the ministry. This is where we got a bit frustrated with the Ministry - this committee and other committees across the province assigned policies to Ministry to ensure that sewage isn't a significant drinking water threat using existing tools like ECAs. The CLI-ECA has the municipalities doing a self-assessment and identifying risk management measures. The important thing for the Committee to be thinking about is whether our Prescribed Instrument policies are being implemented to the satisfaction of the SPC and the SPA. We are using that existing tool of the prescribed instrument to ensure the activity is not a threat, but they're requiring it only if they ask for it.

So, I'm suggesting in this is a verbal presentation to the Source Protection Committee that in our PPI policies that we use for stormwater and sanitary sewage that we add language that the CLI-ECA is required to be reviewed by the ministry.

THAT the Prescribed Instrument policies by amended as presented.

Resolution SPC 17/24 Moved by Jim Drummond
Seconded by Matthew Merrett

Abstained: Jenna Maidment

Carried

13. Adjournment

Resolution SPC 18/24 Moved by Tim Mousseau
Seconded by Ron Barrette

That the June 12, 2024 meeting of the Essex Region Source Protection Committee be adjourned at 5:00 pm. **Carried**

Next Meeting

The next meeting of the Essex Region Source Protection Committee will tentatively be held on November 13, 2024 starting at 4:00 pm at the Essex Civic Centre, Room E.

Tom Fuerth
Chair

Katie Stammler
Water Quality Scientist/
Project Manager Source Water Protection

Ministry of the Environment, Conservation and Parks

Conservation and Source Protection Branch

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Toronto ON M4V 1M2

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Dr. Katie Stammer
Water Quality Scientist/Source Water Protection Project Manager
Essex Region Conservation Authority
360 Fairview Avenue West, Suite 311
Essex, Ontario N8M 1Y6

September 11, 2024

Dear Katie,

Thank you for providing the Conservation and Source Protection Branch (CSPB) with portions (including all the proposed policy changes) of the proposed updates to the Essex Source Protection Plan (SPP,) and Assessment Report (AR), as per the amended Minister's Order under section 36 of the *Clean Water Act, 2006*, issued on May 16, 2019.

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The amended Minister's Order specifies mandatory updates to the AR and SPP to ensure they comply with the amended Technical Rules (Rules), published on the Environmental Registry in March 2017 under posting number 012-8507 and the 2018 amendments to the Rules and General Regulation (O. Reg. 287/07). For your source protection area, this includes:

- assessing locations where the above-grade handling and storage of fuel, as well as liquid hydrocarbon pipelines, pose a significant, moderate, and low risk and ensuring that policies apply to all relevant protection zones;
- assessing the vulnerability of the Great Lakes intakes that the workplan indicates are vulnerable (Lake Erie intakes for Pelee Island West Shore, Union and Wheatley);
- updating the significant groundwater recharge areas to align with the amended Rules.

We understand that you will be using the most current version of the Rules, published December 2021 in your updates and the ministry supports this approach.

Please also include technical work completed within the timeframe of the comprehensive review for changes to drinking water systems, including the Town of LaSalle, City of Windsor and Pelee Island West Shore drinking water intakes where appropriate, as necessary under O.Reg 205/18 of the Safe Drinking Water Act.

For implementation challenges where the committee, authority and affected municipalities determine it is necessary:

- adjust the setback distance from a waterbody to ensure that intake protection zones of the modelled spill area (i.e., event-based area) are captured accurately and reflect local conditions; and,

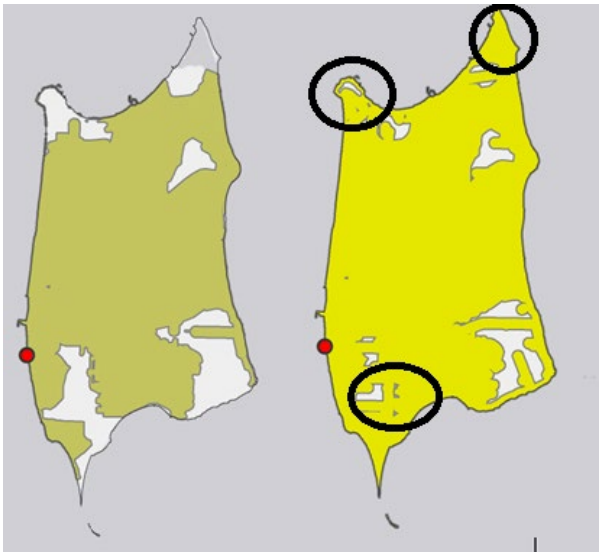
- revise policies to improve clarity and effectiveness, such as policies for non-agricultural source material, and address accurate setback distances as a result of transport pathways.

The following comments reflect input and feedback and those of branch technical staff, and are based on the 2021 Rules in effect at the time the s. 36 updates to the AR and SPP.

Comments on the updated Assessment Report (AR)

Event-Based Areas (EBA) delineation

- The modified EBA for Pelee Island Intake is proposed to extend to the areas circled below.
    - Given the attached modelling summary exercise, please clarify how these areas have been added, i.e., demonstrate the pathway for how the spill would travel to the intake. If a spill occurs from the northeastern area (top-right circle), how would this travel to the intake and cause water quality deterioration?



- Please clarify why some of the proposed modified EBAs associated with some intakes cross the sub-watershed boundaries. EBAs, which are part of IPZs, typically do not cross sub-watershed boundaries.

Microcystin

- The total microcystin and the number of occurrences data for Windsor and Amherstburg intakes indicate that the concentrations are below the 1/2 maximum allowable concentration (MAC) and that the concentrations have been declining for in the past 4-5 years. Please clarify how the Rule 114 (identification of the Issue) is met, including evidence of algal blooms developments with any potentials that they may release the toxic Microcystin-LR. Please also clarify whether the water treatment plants associated with the intakes have been overwhelmed by the concentration of the microcystin LR by providing information and/or data supporting the occurrences.
- Alternatively, the assessment can still identify the microcystin as a water quality concern, i.e., not considered an issue, where Option 3 in your document on the evaluation of microcystin report (draft 2023) can be applied. The AR can state that the parameter will be

monitored in the future to determine whether the TR 114 has been met, as for other intakes.

Comments on the updated Source Protection Plan (SPP) Policies

The following comments are in response to the SPP updates related to the list of mandatory items in the amended Minister's Order.

Handling and storage of fuel

No concerns.

Liquid hydrocarbon pipelines

Essex is proposing one new non-binding strategic action (**22_SpecAct.V9.ER**) in its amended SPP to address pipeline threats as well as a legally binding restricted land use policy (**All_s.59.V8.ER**) to related to significant drinking water threats (SDWTs) posed by liquid hydrocarbon pipelines.

- Only minor editorial changes recommended for **22_SpecAct.V9.ER.**
- Draft Policy **'All_s.59.V8.ER'** is legally binding. However, Source Protection Committees do not have the authority to develop policies legally binding on federal or provincial agencies that have authority over pipeline development, such as the Canada Energy Regulator and the Ontario Energy Board. As such, liquid hydrocarbon pipelines must be removed from this policy and please consider including a note accompanying the policy to be clear that pipelines are not included.

Identification of threat circumstances to align with the amended Technical Rules (throughout the document)

When the Rules were updated in 2021 changes were made to the circumstances under which certain threat activities could be significant (e.g., handling and storage of dense non-aqueous phase liquids, fuel and snow storage), and new waste threat sub-categories were also created (i.e., application of processed organic waste (POW) to land, storage of POW and storage of hauled sewage). In preparing further plan amendments, please review all policies in light of these changed threat circumstances to ensure that threats are adequately addressed, and that both the source protection authority and committee are of the opinion that the current policies are still advisable [as per s.48 (1) of O.Reg. 287/07]. We note that you have already done most of this analysis with the policies submitted for early engagement and we offer the following comments for your consideration:

- Check that the circumstances mentioned in the policies affecting threats 2.3 and 2.4 (stormwater management facilities, both outfalls and infiltration) align with the 2021 Rules to ensure significant drinking water threats are mitigated in the SPP.
- Confirm that threats 1.12 and 1.13 do not exist in Essex Region.

Reminders

Pre-Consultation

- Pre-consultation is required for implementing bodies, persons, and businesses believed to be engaged in significant threats that are affected by the updates, including those affected by new or changing vulnerable areas. This ensures they have ample opportunity for input on policies that create new or changing expectations.

- Where previously approved policies are being extended to new areas (e.g., policies in the SPP remain unchanged, but a vulnerable area is expanding), it is helpful to clearly note this in the pre-consultation notice to implementing bodies and persons/ businesses engaged.

- We recommend including a note in the SPP to clarify how plan updates relate to existing or new policies with explicit implementation timelines (e.g., within 3 years of the effective date). We equally recommend including this information in the pre-consultation notice to implementing bodies. Being silent on this may otherwise be interpreted to mean that these implementation timelines will apply to the amendment (i.e., within 3 years of the effective *date of the amendment*). While not essential, being explicit in the plan about the authority's expectations for implementation timelines could help avoid confusion or misunderstanding for implementing bodies.

Submissions to MECP

- It is helpful for revisions to be readily identifiable through tracked changes, highlight, or in a summary addendum type document. For the submission to MECP, please include any revisions since the early engagement stage.

- Include responses to outstanding comments from early engagement, including any updated technical reports, if applicable and where available. It is helpful for the ministry to receive a copy of the updated SPP in its entirety (incl. appendices, mapping, etc.) at the pre-consultation stage.

- Reminder to update the "consultation summary section" in the SPP to include reference to all required consultation activities (i.e., early consultation, pre-consultation, and public consultation, including the associated dates for each phase).

- Following pre-consultation, document any comments received and how they were addressed in the explanatory document (high-level summary). Also, a reminder that the explanatory document must be updated to include rationale for the policy changes, and if a policy is not included in the Plan for a prescribed drinking water threat (e.g., liquid hydrocarbon pipelines), or where the policy does not address all areas where that threat could be significant.

Thank you for submitting the portions of Essex's updated AR and SPP for our review. Please do not hesitate to contact me at monika.lemke@ontario.ca if you have questions.

Monika Lemke, Program Analyst

MECP Conservation and Source Protection Branch
613-876-3376 | monika.lemke@ontario.ca

C: Jennifer McKay, (A) Manager, Source Protection Section, CSPB
Wendy Lavender, Manager, Technical and Program Delivery Section, CSPB
George Jacoub, Watershed Management-Research Scientist, P.Eng., CSPB

Essex Region Source Protection Committee

Report 07/24

From: Katie Stammler, Source Water Project Manager

Date: Monday, October 21, 2024

Subject: Response to MECP Early Engagement - Policies

Recommendation

THAT the SPC receive SPC Report 07/24

Summary

- All 53 new and amended policies for the ongoing s.36 amendment were provided to the MECP on 2 July 2024
- The MECP provided an official response on 11 September 2024
- Responses to the MECP comments and edits are provided in this Report

Discussion

Amendments to Assessment Reports and Source Protection Plans under Section 36 of the Clean Water Act require multiple stages of consultation after the SPC has completed their work. Early Engagement with the MECP is to seek feedback on technical work and proposed policy work. On 2 July 2024, the ERSPA submitted the following documents to the MECP for Early Engagement:

- All 53 amended and new policies required to align with the 2021 Technical Rules along with explanatory reports and marked up versions of policies to show tracked changes
- New technical report regarding microcystin as a drinking water issue
- New Event Based Area mapping

The ERSPA received an official response from the MECP on 11 September 2024. The MECP also provided additional comments using track changes in individual policy documents. The following report addresses comments from the MECP regarding the submitted policies, which are largely editorial in nature and do not require further action from the SPC at this time.

From the letter dated 11 September 2024

1. MECP comment:
   "Essex is proposing one new non-binding strategic action (22_SpecAct.V9.ER) in its amended SPP to address pipeline threats as well as a legally binding restricted land use policy (All_s.59.V8.ER) to related to significant drinking water threats (SDWTs) posed by liquid hydrocarbon pipelines.

   a) Only minor editorial changes recommended for 22_SpecAct.V9.ER.
   b) Draft Policy 'All_s.59.V8.ER' is legally binding. However, Source Protection Committees do not have the authority to develop policies legally binding on federal or provincial agencies that have authority over pipeline development, such as the Canada Energy Regulator and the Ontario Energy Board. As such, liquid hydrocarbon pipelines must be removed from this policy and please consider including a note accompanying the policy to be clear that pipelines are not included."

   ERSPA response:
   a) The suggested edits for Draft Policy 22_SpecAct.V9.ER include edits to the significant risk circumstances that are incorrect. The MECP suggested including circumstances that only apply to WHPAs with score of 10, which do not exist in the ERSPA. This suggested edit will not be made
   b) Draft Policy 'All_s.59.V8.ER' does not apply to liquid hydrocarbon pipelines. This policy applies to "all activities that are subject to sections 57 or 58", that precludes pipelines. Pipelines are not referred to in this policy. We opted to write the policy this way, rather than naming threats or listing policy IDs, so that it will apply to any future policies or changed policies that use Part IV. No change is necessary

2. MECP comment:
   "Check that the circumstances mentioned in the policies affecting threats 2.3 and 2.4 (stormwater management facilities, both outfalls and infiltration) align with the 2021 Rules to ensure significant drinking water threats are mitigated in the SPP."

   ERSPA response
   The circumstances for threat 2.3 as listed in the 2021 Technical Rules are repetitive and complex to read, so the policies in the Essex SPP use simplified language to condense the circumstances. These have been carefully reviewed to ensure that they correctly reflect the Rules. For example: for IPZs with score 9, certain circumstances are a SDWT if the impervious area is 20-50% or >50%. This is condensed to >20%. Additionally, rather than repeating the definition of impervious area in each circumstance, a single definition is provided. Minor edits have been made in the policy text to ensure alignment with the Technical Rules.

   The circumstance for threat 2.4 is correct.

3. MECP comment:
   "Confirm that threats 1.12 and 1.13 do not exist in Essex Region."

   ERSPA response:
   Threat 1.12 is only a SDWT in IPZ 10s and WHPA 10, neither of which exist in the ERSPA. 1.13 is only a SDWT in WHPA 10s. There is no need to have policies for these threats.

In text edits

The MECP provided in text edits for 38 of the 53 submitted policies, many of which were stylistic edits that were not consequential. Edits of this nature were accepted as appropriate, but not all changes were accepted. All edits that clarify the intent or correct errors in the interpretation of the Technical Rules were accepted. Specific comments and responses are included below.

1. Draft Policy 1.2&1.9_PI.W2.ER MECP comment:
   "Pathogen: Land application of any quantity of processed organic waste in WHPA-E, IPZ-1, IPZ-2, IPZ-3 with a scores of 8"

   ERSPA response:
   This specific policy is intended to address this threat through management specifically in Windsor IPZ-2, which has a vulnerability score of 8.1. This activity is prohibited in IPZ-1s with score 9 in Draft Policy 1.2&1.9_PI.V9.ER. The ERSPA has no WHPHA-Es nor IPZ-1 or IPZ-3 with score 8.

2. Draft Policy 1.3-1.5_PI.V9.ER MECP comment:
   "Consistency among references to O. Reg 347"

   ERSPA response:
   The text referred to in this particular comment was taken directly from the 2021 Technical Rules. We will review all policies that refer to this Regulation to ensure consistency.

3. Draft Policy 2.3&2.4_PI.V8.ER MECP comment:
   In the Rationale statement "Guide is out of date" in reference to a link to the 'Guide for Applying for Approval of Sewage Works'

   ERSPA response:
   The reference has been changed to the online 'Guide to applying for an environmental compliance approval'

4. Draft Policy 2.6&2.8_SpecAct.W1W2.ER MECP edit
   The MECP provided edits to the Significant Risk Circumstances and pasted the relevant portion of the table of drinking water of drinking water threats in the document.

ERSPA response:
The circumstances have been reviewed and corrected as necessary. See also the 'general comment' below.

5. Draft Policy 2.8_PI.V8.1.ER MECP comment:
"Also account for WWTF discharges treated sanitary sewage at an average daily rate that is more than 2,500 but not more than 17,500 m3/year in IPZ-1 v score 10"

ERSPA response:
The ERSPA does not have IPZs with score 10.

6. Draft Policy 14_PI.V8.ER MECP edit
In text edit indicates that the reference to the section of the Environmental Protection Act (EPA) is incorrect. The edit suggests this should read Part IV, while the text states Part V.

ERSPA response:
There are several policies that use this same reference (s.39, Part V, the Environmental Protection Act), which was copied from the original policies in the SPP. The online version of the current EPA shows that s.39 is in Part V, but it has been revoked. This small edit has highlighted the need to review all Prescribed Instrument policies to ensure the correct tool is referred to. The MECP has provide some guidance on this.

General Comment

Many of the comments from the MECP did not seem to take the local aspect into consideration with suggestion that risk circumstances be included that do not apply to the ERSPA. The Essex Region Source Protection Plan only contains policies for activities and circumstances that are identified as a SDWT in the 2021 Technical Rules that apply to the ERSPA. This includes activities and circumstances that would be a SDWT in IPZs with scores between 8 and 9. There are no WHPAs in the Essex Region and no IPZs with a score of 10. That said, all policies will be carefully reviewed to ensure the intent is clear in regard to the vulnerable area to which the policy applies.

RECOMMENDATION

THAT the SPC receive SPC Report 07/24

Katie Stammler, PhD
Project Manager, Source Water Protection

Essex Region Source Protection Committee

Report 08/24

From: Katie Stammler, Source Water Project Manager

Date: Tuesday, October 29, 2024

Subject: Response to MECP Early Engagement – Microcystin

Recommendation

THAT the SPC provide direction on the identification of microcystin as a drinking water issue for the A.H. Weeks and Amherstburg drinking water intakes

Summary

- The reassessment of microcystin as a drinking water issue were provided to the MECP as part of Early Engagement
- The MECP provided an official response on 11 September 2024
- Responses to the MECP comments are provided in this Report

Discussion

Further to SPC Report 07/24, the ERSPA received the following as part of the official response from the MECP on 11 September 2024.

- The total microcystin and the number of occurrences data for Windsor and Amherstburg intakes indicate that the concentrations are below the 1/2 maximum allowable concentration (MAC) and that the concentrations have been declining for in the past 4-5 years. Please clarify how the Rule 114 (identification of the Issue) is met, including evidence of algal blooms developments with any potential that they may release the toxic Microcystin-LR. Please also clarify whether the water treatment plants associated with the intakes have been overwhelmed by the concentration of the microcystin LR by providing information and/or data supporting the occurrences.
- Alternatively, the assessment can still identify the microcystin as a water quality concern, i.e., not considered an issue, where Option 3 in your document on the evaluation of microcystin report (draft 2023) can be applied. The AR can state that the parameter will be monitored in the future to determine whether the TR 114 has been met, as for other intakes.

Essentially, from a technical perspective the MECP is not satisfied that the microcystin data for the A.H. Weeks (Windsor) and Amherstburg drinking water intakes meets the criteria to identify microcystin as a drinking water issue. ERSPA staff anticipated that the analysis for these two intakes may be flagged by the MECP because the concentrations are typically below the half maximum allowable concentration (1/2 MAC). The Committee unanimously determined to identify microcystin as a drinking water issue at their meeting September 13, 2023, based largely on the opinion and responses from the municipalities and water treat operators, who flagged it as an ongoing concern.

The MECP's evaluation is largely valid, with the exception of the statement that 'concentrations have been declining for in the past 4-5 years'. There is insufficient data for trend analysis and as is noted in the report, the concentrations are variable year to year but do continue to show a cyclical seasonal pattern, clearly showing that microcystin continues to be observed annually each summer, but at low concentrations.

Municipal representatives from Windsor and Amherstburg on the SPC and staff from Enwin have been provided information to support discussion on SPC Report 08/24. Based on this discussion, the Committee is asked to determine which of the following options they would like to apply to the A.H. Weeks and Amherstburg drinking water intakes:

1. Continue to advocate for microcystin to be identified as a drinking water intake
2. Identify microcystin as a drinking water concern for these intakes

Under either option, there would be no change to the polices in the Source Protection Plan for microcystin which include using Education and Outreach and Monitoring for the entire Essex Region Source Protection Area. The analysis for each of these intakes would be included in the report and discussion on the SPC's initial decision could be included.

RECOMMENDATION

THAT the SPC provide direction on the identification of microcystin as a drinking water issue for the A.H. Weeks and Amherstburg drinking water intakes

Katie Stammler, PhD
Project Manager, Source Water Protection

Attachment:

Evaluation of microcystin as a drinking water issue – November 2023

Evaluation of microcystin as a drinking water issue for all drinking water intakes in the ERSPA

Purpose and Scope

The Issues Evaluation Method (Appendix VI) and the Technical Rules of the Clean Water Act were used to determine if microcystin-LR is a drinking water Issue for Water Treatment Plants in the Essex Region Source Protection Area. Available total microcystins data from drinking water intakes and interviews with water treatment operators were analyzed following the Issue Evaluation Method.

Background

Harmful algal blooms (HABs) are an annual occurrence in the nearshore areas of Lake St.Clair and in the western basin of Lake Erie. The organisms that cause HABs are cyanobacteria, also known as blue-green algae (e.g. microcystis and anabaena) that produce toxins (e.g. microcystins) that can be harmful to human health. Microcystin is a neurotoxin which is present in blue green algae (cyanobacteria) and consists of several congeners, including –LR, which is considered to be the most toxic. It is released into the water when the cell wall breaks. Microcystin-LR is a parameter listed on schedule 2 of the Ontario Drinking Water Quality Standards with a maximum allowable concentration (MAC) of 1.5 ug/L.

Laboratory analysis typically involves an initial ELISA test for total microcystins (i.e. all congeners). The analysis to determine specific congeners (e.g. Microcystin-LR) is cost prohibitive so it is only conducted when it is deemed necessary, and that analysis can only be conducted at the MECP accredited lab. However, microcystin-LR tends to be the dominant congener of microcystins in the lower Great Lakes (Palagama et al. 2020; Dyble et al. 2008); therefore, we can assume that total microcystins are an appropriate estimate of microcystin-LR.

Whole lake experiments conducted by David Schindler in the Experimental Lakes Area tested and confirmed the theory that phosphorus is the key nutrient that drives eutrophication (high nutrient concentrations that lead to overgrowth of algal biomass) (Schindler, 1977). Under the 1972 Great Lakes Water Quality Agreement (GLWQA, 2012), the U.S. and Canada reduced phosphorus inputs to the Great Lakes, including Lake Erie. Between the late 1960s and early 1980s there was an approximate 60% reduction in the phosphorus loading to Lake Erie and a subsequent reduction in algal blooms. Despite continuing to meet targets for phosphorus loads, however, Lake Erie began to experience algal blooms again in the late 1990's, with 2011 and 2015 as the largest blooms on record (ECCC & MECP, 2018).

The National Oceanic and Atmospheric Administration (NOAA) uses a suite of models to predict the severity (i.e. size and biomass) of the HAB in Lake Erie each year. The prediction is largely based on phosphorus loads from the Maumee River in Ohio, which are highly dependent on rainfall events during the late winter and early spring months. Once a HAB occurs, NOAA provides weekly updates on the current and predicted extent of the HAB and at the end of the season, a final report is provided. These reports are all publicly available. Importantly, the

forecasts cannot predict toxicity and do not include Lake St. Clair. The toxicity of a HAB is dependent on myriad factors that are highly variable and difficult to model, which is why monitoring during a HAB is essential.

Each seasonal forecast also includes a summary of the severity of HABs in previous years (**Figure 1**). Severity is scored on a 10 point scale. When the scale was developed, 2011 was the worst year on record and was given a score of 10, however 2015 was considered more severe and received a score of 10.5. Severe HABs were also observed in 2017 and 2019. Since 2020, HABs in Lake Erie have been considered moderate and the extent has rarely reached the north shore where the Essex Region drinking water intakes are located. These moderate blooms are considered to be attributable to drier conditions in the late winter/early spring months, resulting in lower nutrient loads and not necessarily to mitigation actions. It is normal for the Great Lakes to experience cycles of wetter and dryer years, so we must be prepared to expect HABs in any given year. The location and extent of a HAB and distribution of toxins are dependent on weather conditions, wind and lake currents. The Essex Region Source Protection Annual Progress Reports also include a summary of HAB conditions and related activities each year.

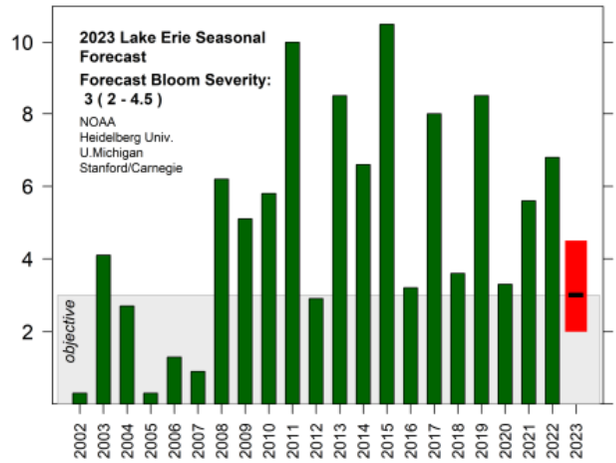


Figure 1 – Bloom severity forecast (red) as of July 29, 2023 compared to actual severity in previous years (green). The wide red bar is the likely range of severity based on the different models used and reflect uncertainty in the July nutrient load. A severity below 3 is the goal of the Great Lakes Water Quality Agreement (GLWQA). Available Online.

Defining a drinking water issue

A contaminant can be identified as a drinking water issue if it meets certain criteria, the specifics of which are described below. Typically, when an issue is identified, an area where the contaminant likely originates from, called the issue contributing area (ICA), is defined. Significant drinking water threat (SDWT) activities are identified, and legally binding policies are developed and included in the Source Protection Plan. However, in the case of microcystins that result from HABs in Lake St. Clair and Lake Erie, it is not possible to define a reasonable ICA in which policies can be implemented. The area contributing to nutrients that determine the extent and severity of a HAB not only expand beyond the boundaries of the Essex Region, but also include watersheds in the United States, where our policies cannot be implemented. As

well, the contribution from watersheds in the Essex Region is considered to be relatively small compared to larger watersheds like the Thames and Maumee River (Maccoux et al, 2016), although the Leamington Tributaries have also been identified as a priority watershed for nutrient reduction (ERCA, 2023). Importantly, the Canadian and US Federal, Provincial and State governments have developed Domestic Action Plans (ECCC and MECP, 2018) and are investing extensive funds to address this international issue. Any policies or compliance measures will need to be broadly applied and are beyond the scope and reach of the Clean Water Act.

Identifying microcystin as a drinking water issue acknowledges that HABs are an ongoing, pervasive problem for water treatment plants in the Essex Region. This information is important when communicating with higher levels of government and helps to inform their actions and policies. Because it is not possible to identify an ICA within the scope of the Essex Region Source Protection Plan (SPP), it is not possible to identify SDWT activities nor polices to manage or prohibit activities. Instead, the SPP includes policies that require continued monitoring and the delivery of education and outreach.

Water Treatment Plants in the Essex Region

During the preparation of the 2018 ERSPA S.36 Workplan, Municipal staff at Water Treatment Plants (WTPs) were asked several questions related to HABs. All seven WTPs in the Essex Region indicated that they consider HABs to be an operational concern; this includes WTPs with intakes in Lake St.Clair, the Detroit River and Lake Erie. WTPs employ several different techniques to treat raw water during a HAB (see below). The existing treatment at all of the WTPs is currently capable of removing cyanobacteria and microcystins, however there is some concern that some systems could be overwhelmed if HABs increase in severity.

Municipal Drinking Water Licenses

All municipal drinking water treatment plants are required to have a municipal drinking water licence (MDWL), which is issued by the MECP through the Safe Drinking Water Branch. The MDWL is renewed every five years. Each MDWL contains several sections. System-Specific Conditions for each WTP are included in Schedule C of their MDWL. These conditions can include such things as rated capacities, maximum flow rates restrictions, flow measurement and recording requirements, etc. This is also where any additional sampling, testing and monitoring requirements (i.e. microcystin monitoring) are included.

All Municipal Residential WTPs in Ontario that use surface water as a source are required to have a harmful algal bloom (HAB) monitoring, sampling and reporting plan, this includes all of the surface water systems in the Essex Region. It is up to the owners to design their plan, which has to meet the minimum requirements in the license. The HAB plans for WTPs in the Essex Region are included in Schedule C, Section 6.0 of each facility's Municipal Drinking Water Licence. The sections below summarize some of the actions identified in MDWLs for WTPS in the Essex Region. Note that some actions are unique to specific WTPs, while others (e.g. monitoring) are ubiquitous.

Monitoring for HABs at Water Treatment Plants in the Essex Region

All Water Treatment Plants (WTPs) in the Essex Region employ seasonal monitoring for HABs between June and November. Typically, both raw water and treated water are collected for laboratory analysis at regular intervals, usually weekly. Established protocols require increased sampling frequency when a bloom is observed or if laboratory analysis indicates high concentrations of microcystin. Plant operators also conduct daily monitoring for evidence of a bloom by visually observing the conditions of the source water (Lake St.Clair, Detroit River or Lake Erie), visual monitoring of the influent at the shoreline/lowlift areas, monitoring the intake area through the facility's security camera and/or using binoculars, monitoring weather (rain, wind) that has direct impact as precursor to HAB formation, communication with WTP operators upstream and downstream, and/or by using satellite imagery tools. Lake Erie has additional tools available with real-time sensors deployed on buoys and weekly forecasts made available by the National Oceanic and Atmospheric Administration (NOAA).

The following operational parameters are also monitored at some WTPs

- Taste and odour events/odours noted in raw water within plant
- Increases in colour
- Detection of phycocyanin (the pigment present in cyanobacteria) using optical probes is indicative of the presence of cyanobacteria, but not the concentration of toxin
- Increases/diurnal changes in pH in the raw water
- Increases in turbidity/decreases in filter run times
- Need for increased coagulation dose
- Increases in chlorine demand or decreases in chlorine residual
- Visual cues inside treatment facilities (e.g., clarifier, filter) as cyanobacteria may accumulate on equipment even in absence of a bloom in source
- Daily Microscopic Observations

Water treatment operations during a harmful algal bloom

The toxin produced by cyanobacteria are released when the cell dies or when the cell wall is broken, which can happen during the normal water treatment process (e.g. chlorination). For this reason, it is often necessary for WTPs to alter their treatment process during a HAB. Some factors that determine when the decision is made to alter treatment include: visual detection of a bloom, detection of microcystin in the raw or treated water, weather conditions conducive to HAB formation, satellite imagery showing visible signs of a HAB. In addition, changes to certain operational parameters can also be indicative of a HAB, for example:

- Changes in pH in the raw water– Algae draws CO_2 out of the water during photosynthesis, which may cause pH to increase throughout the day. pH increases are more often observed when the bloom is expanding
- Increase in turbidity and decreases in filter run times, overall filter performance is limited
- Settler performance resulting in carryover

- Clarifier observations
- Need for increased coagulation dose – due to increased turbidity and total organic matter in water or the tendency for some cyanobacteria to float and inhibit settling
- Jar tests for coagulation settling vs floating algae
- Increase in chlorine demand or decrease in chlorine residual – due to increased organic matter loading during a bloom
- Ozone demand increases
- Visual cues inside treatment facilities (e.g., clarifier, filter) as cyanobacteria may accumulate on equipment even in the absence of a bloom in the source water

WTPs have different methods by which they treat water during a HAB, but all are effective at ensuring that there are no cyano-toxins present in the finished treated water. Importantly, all WTPs indicate that additional treatment or adjustment to treatment is necessary during a HAB. Most WTPs have sufficient treatment options and have not required updates with a few exceptions. The West WTP on Pelee Island underwent significant upgrades in 2015, Union Water Supply System (UWSS) recently acquired a new filtration system specific for the treatment of HABs, and some operators note that there is aging infrastructure that may need to be upgraded in the future.

Treatment options during a HAB include:

- Shut off or minimize pre-chlorination system that is used for zebra mussel control
- Limit flow from the intake during the day and make up water during the night (if feasible)
- Increase pre-filtration chlorination to oxidize toxin
- Increase travelling screen cleaning operation frequency.
- Use of carbon media filtration, which is known to be effective for cyanobacteria
- Closely monitor coagulation and sedimentation for removal of algae and turbidity, make adjustments to optimize clarifier operation.
- Add filter aid or polymer to enhance coagulation/filtration. Coagulation results in a heavier floc encourages the cyanobacteria to settle rather than float. At a lower coagulation, the cyanobacteria can pass through the filter as pin-floc.
- Increase settling basin sludge removal frequency where feasible.
- Increase filter backwashing frequency.
- Implement a filter-to waste cycle following backwash that is long enough to flush out any residual toxins remaining in the filters.
- Add carbon filters and/or initiate powdered activated carbon addition and/or adjust dosage, where available.
- New DAF (dissolved air floatation) unit in operation at UWSS, which is designed to manage conditions during a HAB infiltration and diverting as much flow as possible to the DAF units.
- Focus chemical disinfection on post-filtration processes.
- Increase ozone dosage
- Increase free chlorine residual

- Chlorine dosing after filtration and proper contact time in the reservoirs can mitigate any toxins if released in upstream processes. Final treated water chlorination also provides toxin oxidation and persistent residual throughout the distribution system
- Consider additional monitoring for total microcystins within treatment process (e.g., filter effluent)
- Constant monitoring of plant conditions, and frequent visual monitoring
- Depending on location of algal bloom and water demands, reduce plant production or shutdown affected plant. Use reserve water until HAB passes

Issue Evaluation

Under the Clean Water Act (CWA), the Director Technical Rules (DTR) define how to identify drinking water issues. Assessing an issue requires consideration of the rules related to issue identification. If an issue is identified pursuant to rule 114, then rule 115 outlines the information which must be included in the Assessment Report (AR). Rule 115.1 was added November 16, 2009 (along with other revisions in this section of the rules). For issues not identified pursuant to rule 114, rule 115.1 identifies the information which must be included in the AR. (This is later described as an Issue under the Clean Water Act, while Issues Identified pursuant to Rule 114 are referred to as issues identified pursuant to the rules.) Refer to **Appendix VI** of the Assessment Report for detailed information on the issue evaluation methodology that was adopted in 2009.

Rule 114:
The source protection committee shall describe a drinking water issue in accordance with Rule 115 if a listed parameter (i.e. microcystin) is present at a concentration that could deteriorate drinking water quality OR there is a trend of increasing concentrations of the parameter that that may result in the deterioration of drinking water quality.

Rule 115:
If an issue is identified with rule 114, where the drinking water issue is the result of anthropogenic causes, the description of the issue shall include the following information: the parameter, the intake at which the parameter occurred, the Issue Contributing Area (ICA) and SDWT activities that contribute to the parameter.

Rule 115.1:
For drinking water issues that are not described under rule 115, the description the drinking water issue shall include, the parameter and an explanation of the nature of the issue and the possible causes of the issue.

Data Sources

Monitoring for microcystin typically occurs weekly throughout the warmer months when harmful algal blooms may occur (June – October), with some years extending earlier or later in the season. Once the concentration of total microcystins in the raw water reaches a threshold level, sampling frequency may be increased until the toxin concentration decreases.

Data up to and including 2018 for most WTPs were obtained from the Drinking Water Surveillance Program (DWSP) which is co-ordinated by the MECP. DWSP samples were collected by staff at the WTP and analyzed by the MECP laboratory using consistent lab and data management techniques. Beginning in 2019, monitoring for microcystin became the responsibility of municipalities. Data from 2019 onward are provided directly by municipalities or their water operator authority. These data are provided in different formats with different levels of understanding as outlined below. Some WTPS have overlapping records from private labs and DWSP, DWSP data were preferentially used if both data sources were available.

Importantly, there are inherent uncertainties in the dataset. Since microcystin was removed from the suite of analytes included in the DWSP program, there is variability in how each municipality conducts their sampling and manages their data, making it challenging to gather and analyze these data. Municipalities now use private labs for analysis of total microcystins, however some labs report this erroneously as microcystin-LR. We understand that private labs cannot analyze for congeners and so assume that the data are actually total microcystins based on our evaluation of their laboratory analysis description. In addition, the municipalities are using different private labs, thus adding uncertainty due to potential differences in lab methodology. There are also gaps in some of the data records, most importantly on Pelee Island. Up until 2018, samples were collected from Lake Erie near the intake and also within the plant after sand filtration and prior to treatment. We know that the sand on Pelee Island has natural microbial characteristics that result in the break down of microcystin (Salter, in preparation) so samples taken within the plant are not truly representative of the source water conditions. Since 2019, samples have been taken sporadically within the plant, but not in Lake Erie, so there are no data available for the source water after 2018. The MECP is supporting the Township of Pelee to collect and analyze Lake Erie samples in 2023, this report will be updated once those data are available. There are also discrepancies between the results from private labs and the MECP lab when there is overlap in the data records, most notably at the Union intake, where the MECP results tend to be higher than the private lab. It would be beneficial for this pervasive issue to be monitored and analyzed consistently, with the data maintained in a managed database.

Treated water is also sampled at the same time as raw water for total microcystins. However, all water treatment facilities in the Essex Region are effective at degrading the toxin and so it has never been detected at concerning concentrations in treated water. These data are not included in this analysis.

Data Evaluation

A number of analyses were conducted following the Issue Evaluation Methodology (Appendix VI). These lines of evidence taken together were evaluated by the source protection committee to determine whether microcystin should be identified as a drinking water issue for each drinking water intake in the Essex Region.

Step 1

Surveys were circulated to Water Treatment Plant Operation Authorities during the preparation of the Essex Region s.36 Workplan in 2018, and again in 2023 in the preparation of this evaluation. In 2018 and 2023, all Operating Authorities identified microcystin as an operational concern for all drinking water intakes in the Essex Region.

Step 2

Total microcystins from the raw water intake were evaluated as follows:

- Monthly average total microcystins concentrations were calculated and plotted for all years for which data were available between 2011 and 2022
- Annual average total microcystins concentration were calculated and plotted for all years for which data were available between 2011 and 2022. Data between July and October when harmful algal blooms are most likely to produce toxins were used for this analysis
- The total number of occurrences of data points above the MAC* or ½ MAC were recorded

*the Maximum Allowable Concentration (MAC) = 1.5 ug/L and the half MAC = 0.75 ug/L.

Step 3

To make the decision to identify microcystin as a drinking water issue the following were considered:

- Data occur at MAC or ½ MAC or above
- Data are trending to MAC
- Frequency of occurrence
- Treatment Plant capability/Need for change to treatment process
- Operating Authority opinion

For each intake, the sections below will include an evaluation of each of these elements.

Possible outcomes of Issue Evaluation

The MECP provided the following options for identifying microcystin as a drinking water issue for Lake Erie intakes when the ERSPCA conducted similar work in 2014

1. If the issue is identified under the technical rules (114), then an Issue Contributing Area (ICA) must be delineated, Significant Drinking Water Threats (SDWT) must be identified, and policies to address the threats must be completed

2. If the issue is identified under the CWA ONLY (Rule 115.1), then the Issues Contributing Area cannot be delineated nor SDWTs be identified within the ICA related to the Issue. E&O and Monitoring policies can be included in the SPP.

3. If there is no issue identified, the SPC has the option only to write generic policy as E&O / Incentive Programs under S.22 [7] of the CWA considering that the policies meet the objectives of the Source Protection Plan.

Following the evaluation in 2014, members of the Technical Advisory Committee (TAC) felt that there was enough evidence of microcystin-LR at the Lake Erie drinking water intakes to consider it a concern, and therefore determined that option 3 was not appropriate. It was suggested that option 1 would be very difficult to implement given the limited microcystin data, inconclusive results of phosphorus modeling and the knowledge that HABs are an international concern with nutrient inputs from several watersheds outside of the Essex Region. By consensus, the Essex Region TAC agreed that option 2 was the best way to proceed as it allowed for identification of the issue and establishment of appropriate policies including those directed at monitoring. The Thames-Sydenham and Region TAC also separately came to the same conclusion for the same reasons. The Essex Region SPC accepted the recommendation of the TAC in July 2014 and determined that microcystin-LR be identified as an issue under the Clean Water Act pursuant to rule 115.1 at Lake Erie intakes. The SPC reviewed results of a similar analysis in October 2021 and determined that microcystin should be identified as a drinking water issue for drinking water intakes in Lake St. Clair under option 2.

The Essex Region SPC examined the analysis included in this report in September 2023 and considered these same options for all of the drinking water intakes in the Essex Region. Following evaluation, the SPC unanimously decided to identify microcystin as a drinking water issue under option 2 for all of the drinking water intakes in the Essex Region.

Results of Data Evaluation

For each drinking water intake, two graphs have been prepared to display total microcystin concentrations in micrograms/litre (ug/L) in the source water prior to treatment. Each graph also displays the maximum allowable concentration (MAC), which is 1.5ug/L and the half maximum allowable concentration (½ MAC), which is 0.75ug/L. The first graph for each intake shows monthly average concentrations for each year. The years are colour coded and are the same for each intake. The second graph for each intake displays the average concentration of total microcystins between July and October, when HABs are most likely to be present. A third graph is included to show the total number of occurrences each year when microcystin concentration was above the MAC or ½ MAC. A summary is provided for each intake in consideration of the following metrics:

- Data occur at MAC or ½ MAC or above
- Data are trending to MAC
- Frequency of occurrence
- Treatment Plant capability/Need for change to treatment process
- Operating Authority opinion

Lake St. Clair

Stoney Point

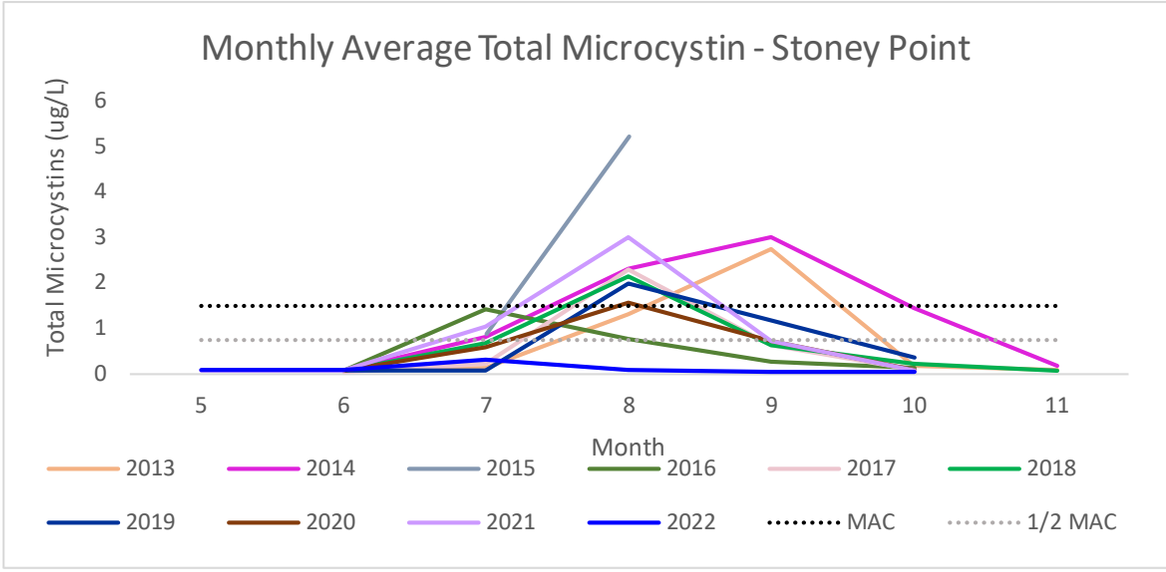


Figure 2 – Monthly average concentration of total microcystins in the raw water at the Stoney Point drinking water intake from 2013-2021.

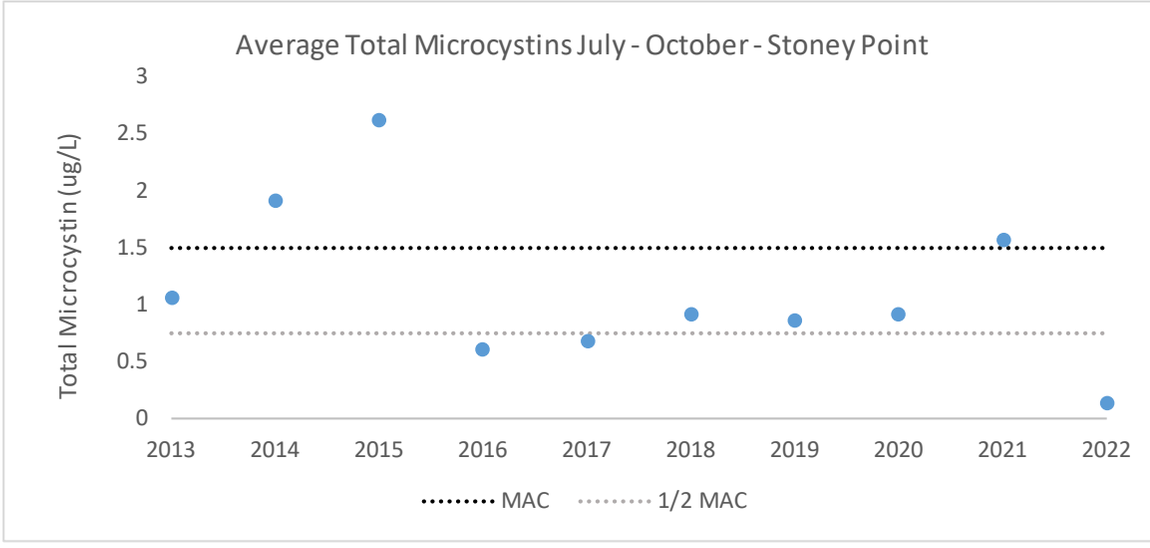


Figure 3 – Annual average concentration of total microcystins in the raw water at the Stoney Point drinking water intake from 2013-2021.
**2015 only has data for July and August when concentrations were high

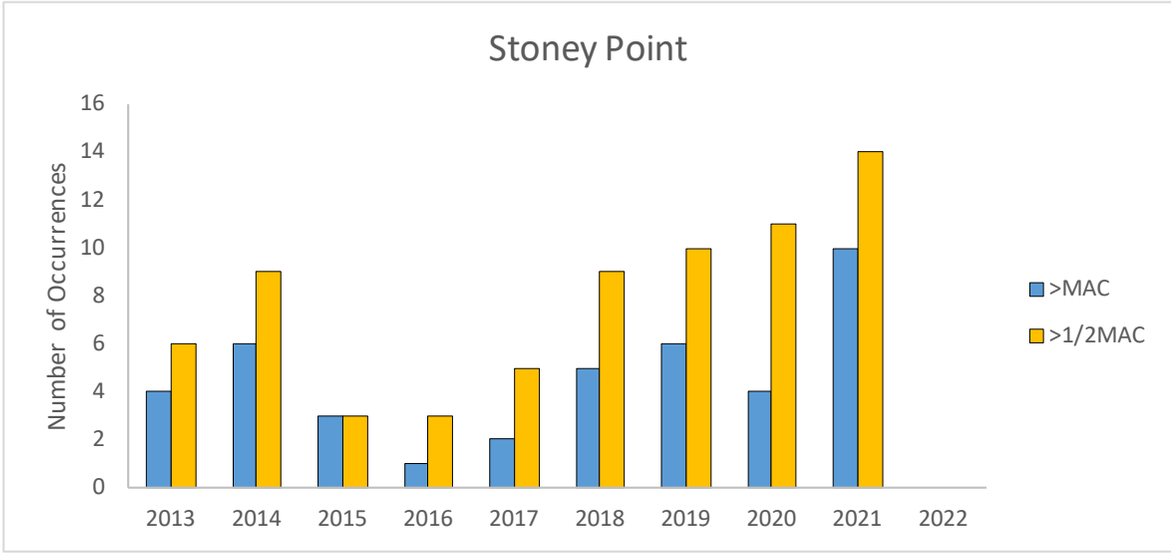


Figure 4 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Stoney Point drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2022.

Summary:

The graphs show the seasonal nature with high total microcystins concentration during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The graphs also show the variability and unpredictability in the toxicity of the bloom each year, and that total microcystins concentration is frequently above the threshold to be considered a drinking water issue.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and persists throughout the summer months
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the Stoney Point drinking water intake at their meeting on October 13, 2021 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1). This decision was confirmed at their meeting on September 13, 2023.

Belle River

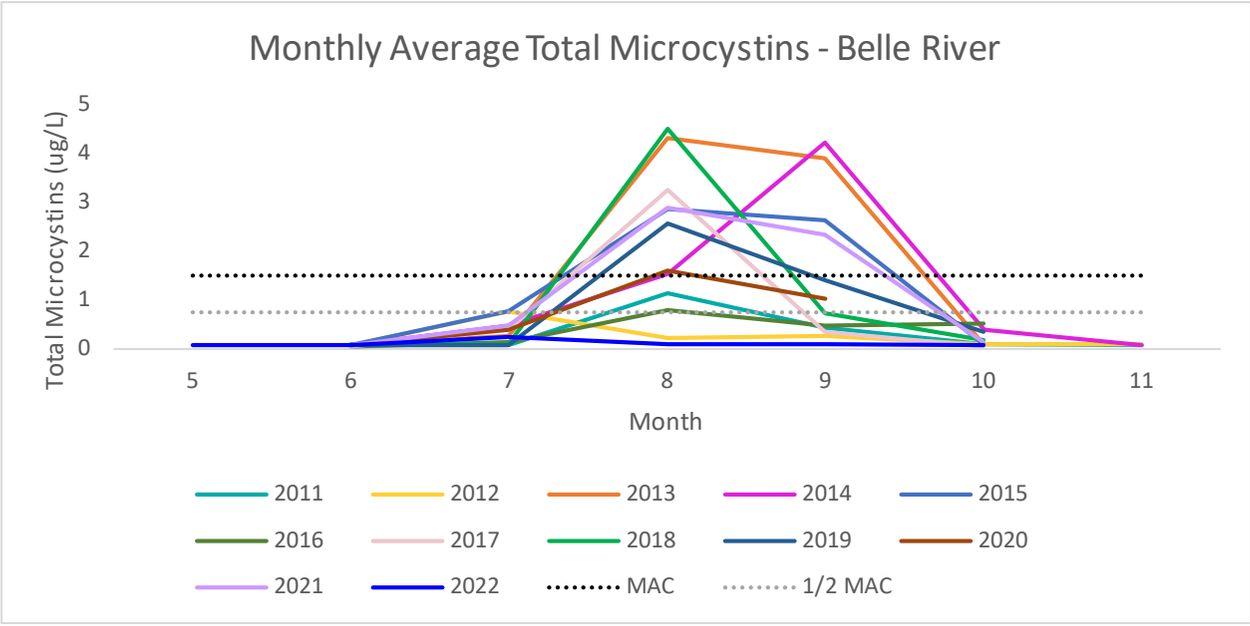


Figure 5 – Monthly average concentration of total microcystins in the raw water at the Belle River drinking water intake from 2011-2022.

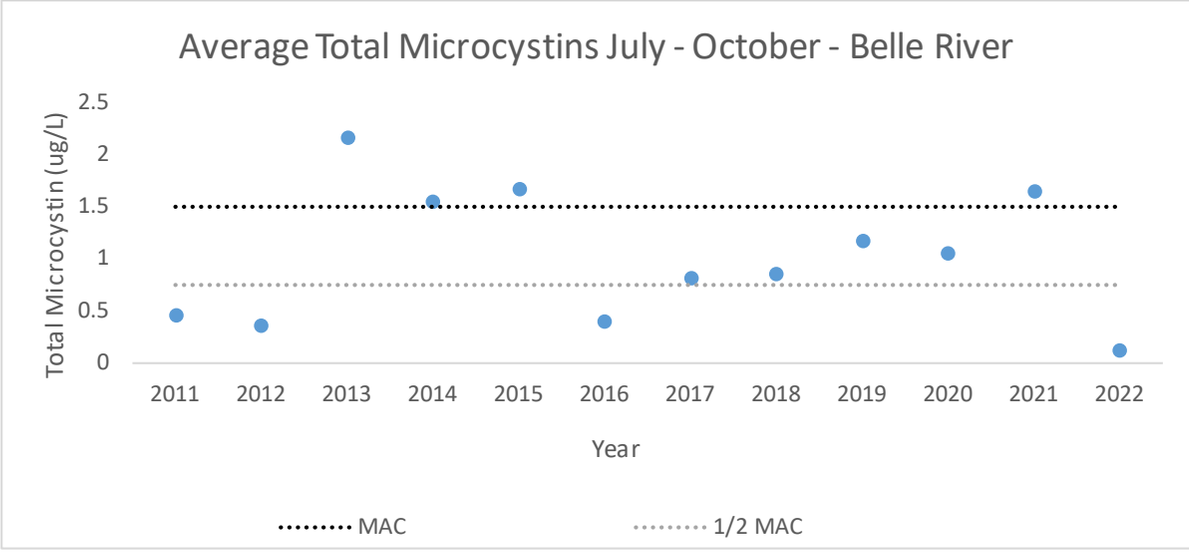


Figure 6 – Annual average concentration of total microcystins in the raw water at the Belle River drinking water intake from 2011-2021.

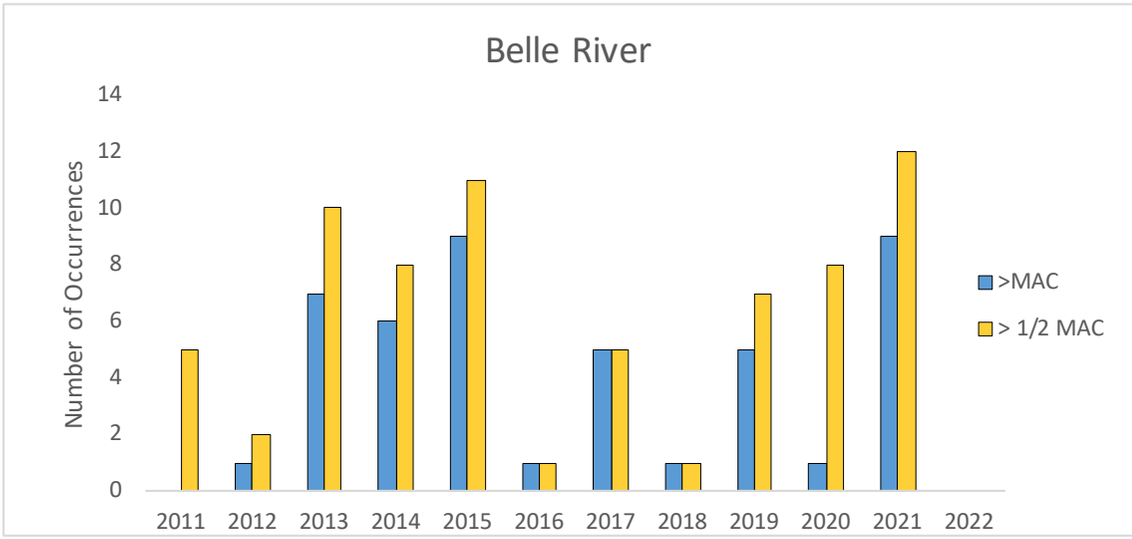


Figure 7 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Belle River drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2022.

Summary:

The graphs show the seasonal nature with high total microcystins concentration during the summer months each year, which coincides with the timing of HABs in Lake St.Clair. The graphs also show the variability and unpredictability in the toxicity of the bloom each year, and that total microcystins concentration is frequently above the threshold to be considered a drinking water issue.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and persists throughout the summer months
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the Belle River drinking water intake at their meeting on October 13, 2021 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1). This decision was confirmed at their meeting on September 13, 2023.

Detroit River

The Detroit River itself does not experience harmful algal blooms because the water is fast flowing and the environment is not conducive to algal growth. However, the drinking water intakes in the Detroit River are downstream of Lake St.Clair, which does experience toxin producing harmful algal blooms each year. As such, they are also required to monitor for microcystin in the raw water.

<u>Windsor – A.H. Weeks drinking water intake</u>

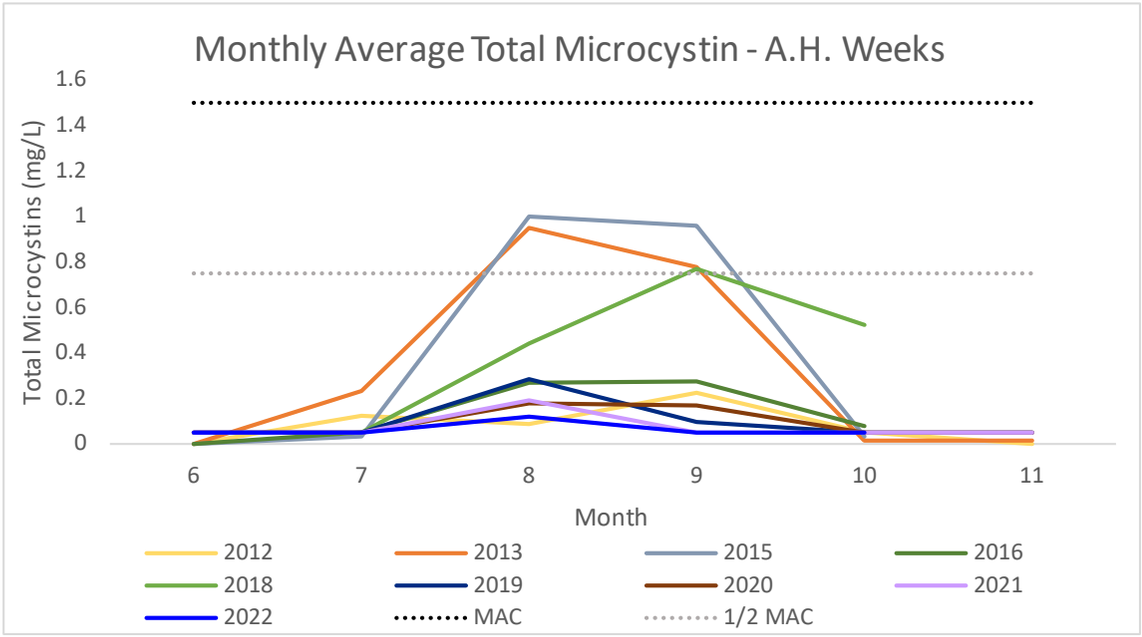


Figure 8 – Monthly average concentration of total microcystins in the raw water at the A.H. Weeks drinking water intake from 2012-2022.

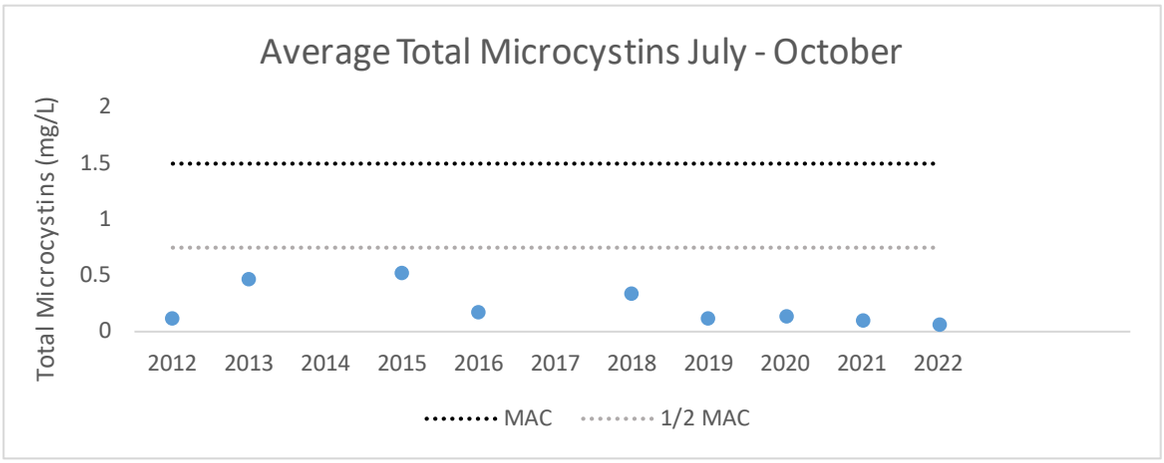


Figure 9 – Annual average concentration of total microcystins in the raw water at the A.H. Weeks drinking water intake from 2012-2022.

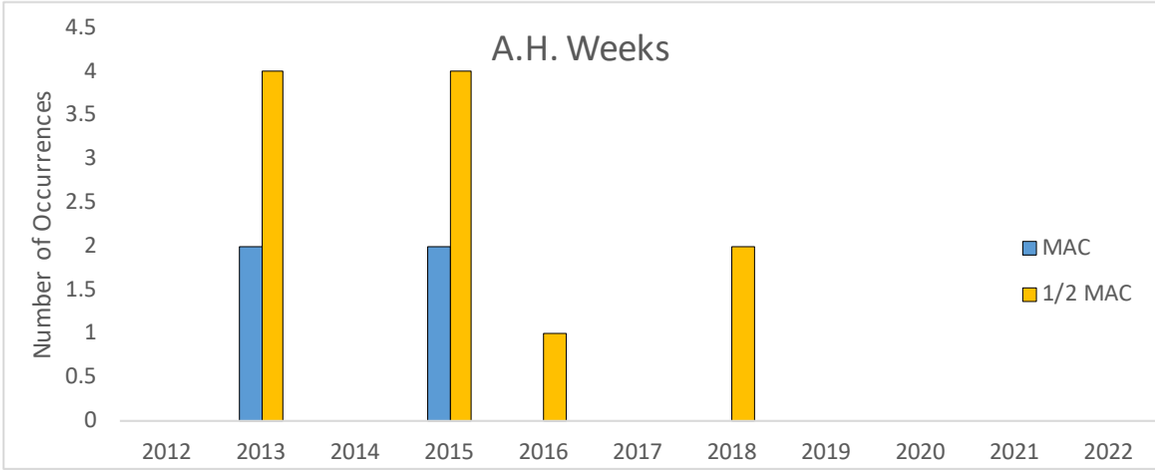


Figure 10 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the A.H. Weeks drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2012 or between 2019 and 2022 and there were no data collected in 2014 and 2017.

Summary:

Average monthly total microcystins concentration is typically below the ½ MAC with concentrations between the ½ MAC and MAC in 2013 and 2015 only, and no average concentration above the MAC. However, the seasonal nature is still clear with higher concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The number of individual occurrences above the MAC and ½ MAC was also low in all years for this intake, with no occurrences above either benchmark between 2019 and 2022.

- Concentration of total microcystin is sometimes at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is rarely seen at or above maximum allowable concentration (MAC)
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the A.H. Weeks drinking water intake at their meeting on September 13, 2023 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1).

Amherstburg

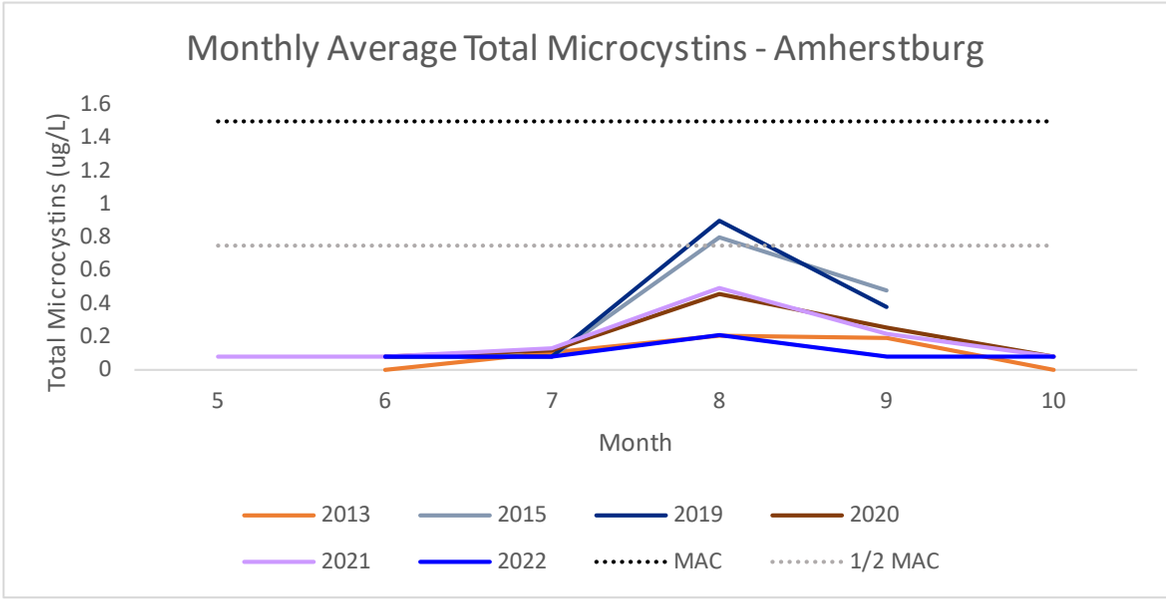


Figure 11 – Monthly average concentration of total microcystins in the raw water at the Amherstburg drinking water intake from 2013-2022 using all available data.

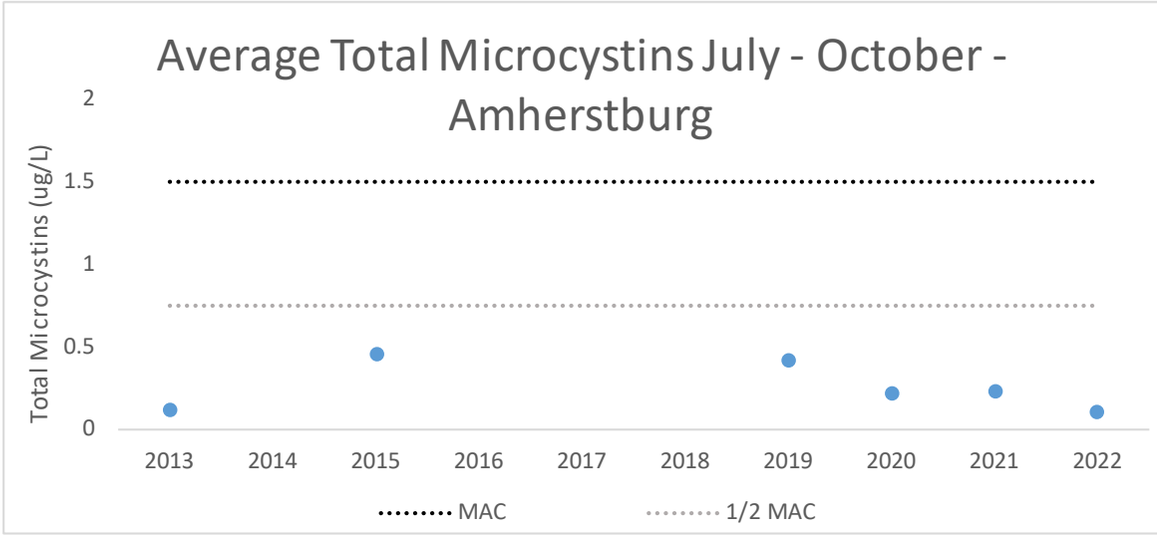


Figure 12 – Annual average concentration of total microcystins in the raw water at the Amherstburg drinking water intake from 2013-2022 using all available data.

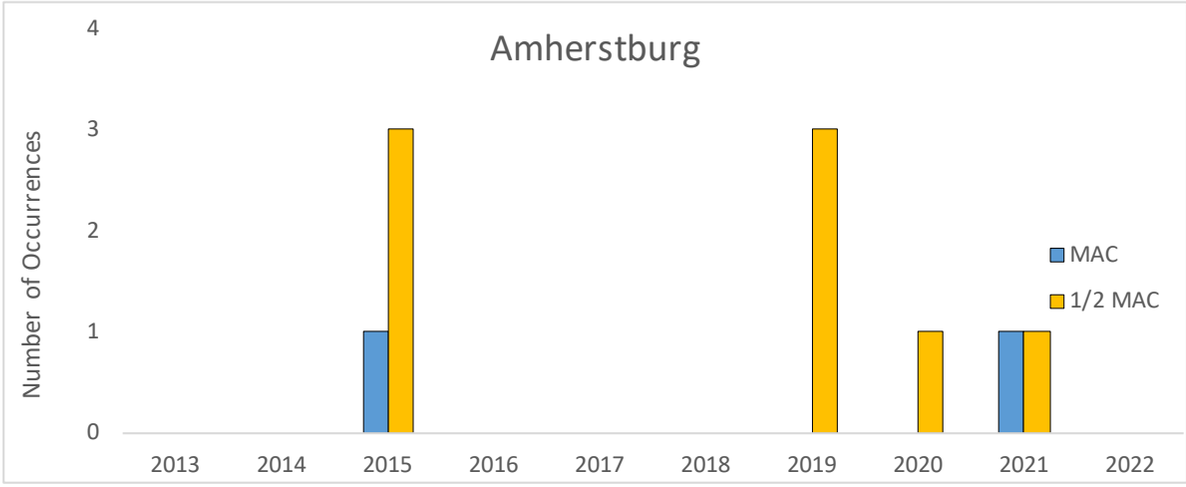


Figure 13 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Amherstburg drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences in 2013 and 2022 and there were no data collected in 2014, and 2016-2018.

Summary:

Average monthly total microcystin concentration is typically below the ½ MAC with concentrations between the ½ MAC and MAC in 2015 and 2019 only, and no average concentration above the MAC. However, the seasonal nature is still clear with higher concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake St.Clair. The number of individual occurrences above the MAC and ½ MAC was also low in all years for this intake.

- Concentration of total microcystin is sometimes at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is rarely seen at or above maximum allowable concentration (MAC)
- There are insufficient data to conduct trend analysis due to several years of missing data prior to 2019
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The Essex Region SPC determined that microcystin should be considered a drinking water issue for the Amherstburg drinking water intake at their meeting on September 13, 2023 under 'Option 2' - the issue is identified under the CWA ONLY (Rule 115.1).

Lake Erie

Harrow-Colchester

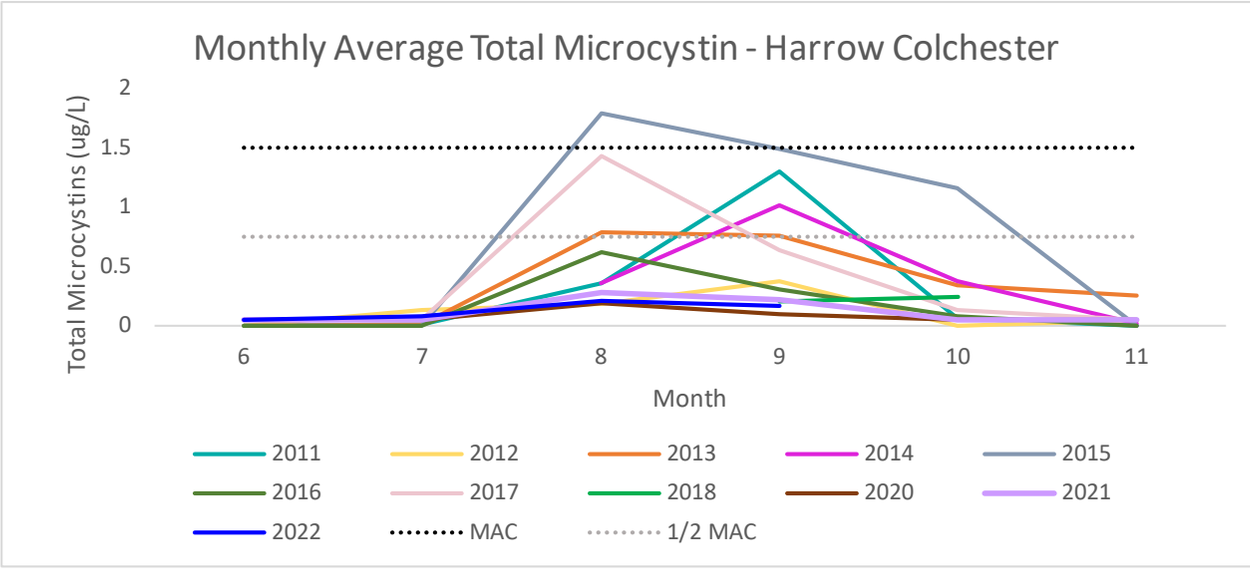


Figure 14 – Monthly average concentration of total microcystins in the raw water at the Harrow-Colchester drinking water intake from 2011-2022

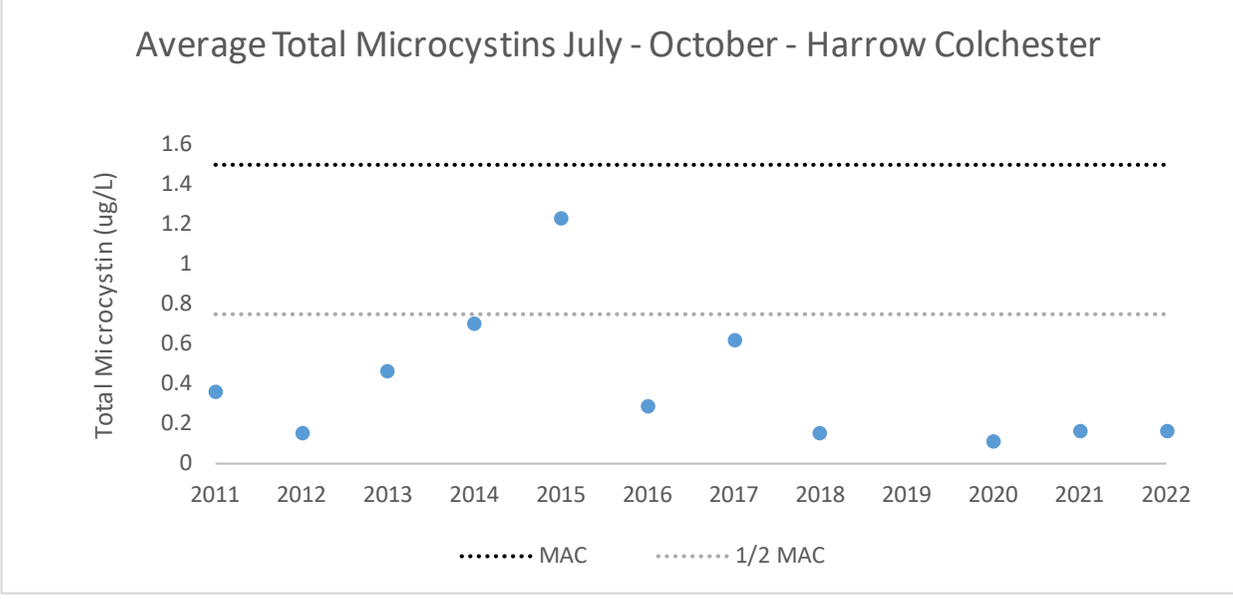


Figure 15 – Annual average concentration of total microcystins in the raw water at the Harrow-Colchester drinking water intake from 2011-2022

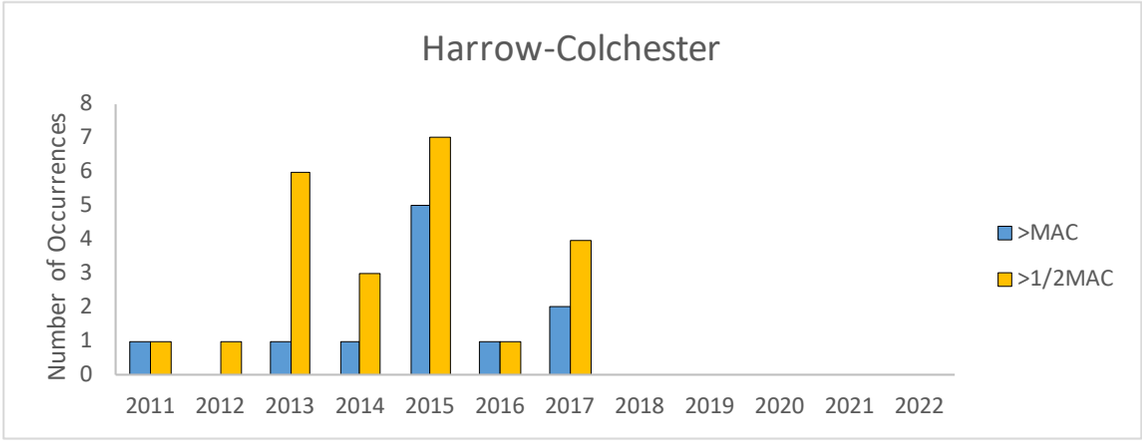


Figure 16 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Harrow-Colchester drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration is typically below the ½ MAC with average concentrations between the ½ MAC and MAC in 2011, 2013, 2014 and 2015. Importantly, since 2018 there have been no concentrations above the ½ MAC. There are two factors that should be considered – there was a change in the laboratory conducting the analysis in 2019, and Lake Erie has experienced less severe blooms in recent years. With these two confounding factors, it is difficult to say with certainty whether this is a data artifact or a true representation of conditions, however, visual and satellite observations provide support that concentrations likely were truly lower in recent years. Even though concentrations are lower in recent years, there is still a seasonal pattern and it is necessary for the WTP operator to monitor conditions.

- Concentration of total microcystin has been frequently seen at or above half maximum allowable concentration (½ MAC), although not in recent years
- Concentration of total microcystin has been regularly seen at or above maximum allowable concentration (MAC), although not in recent years
- There is no trend in the annual concentration of total microcystin, but rather there is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake Under Option 2 based on analysis conducted in 2014. This decision was confirmed at their meeting on September 13, 2023.

Union

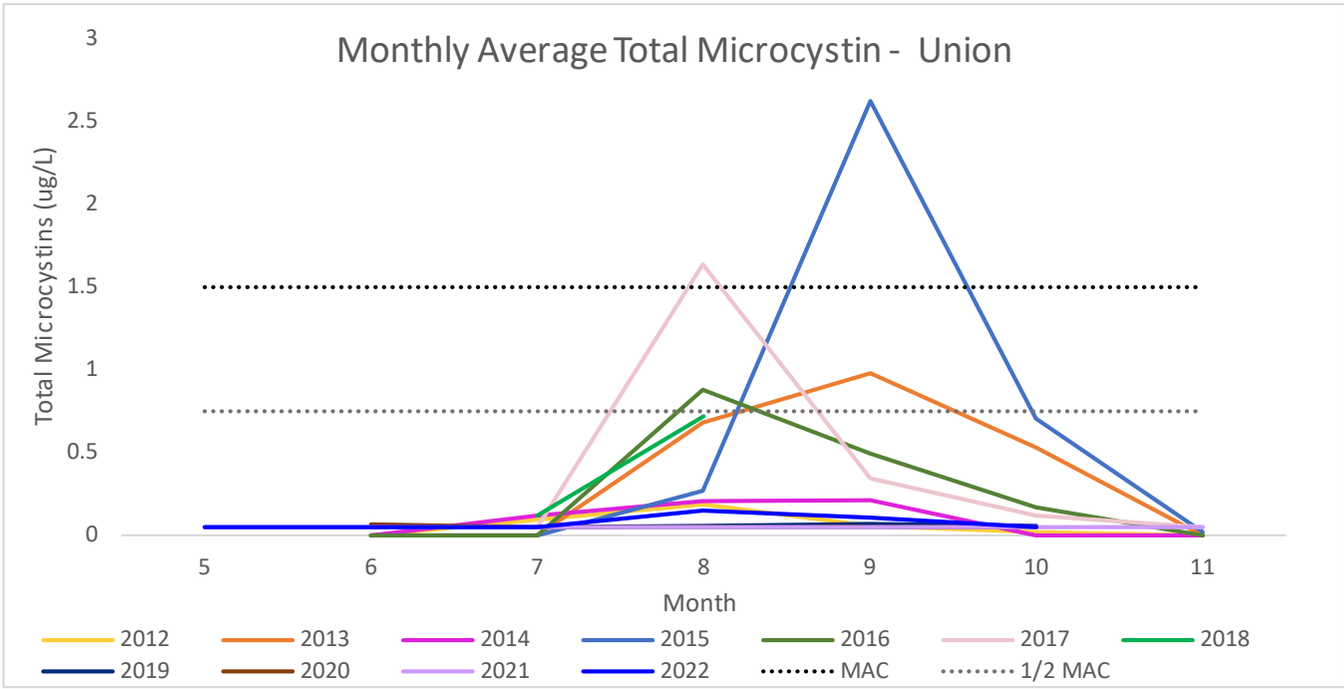


Figure 17 – Monthly average concentration of total microcystins in the raw water at the Union drinking water intake from 2012-2022

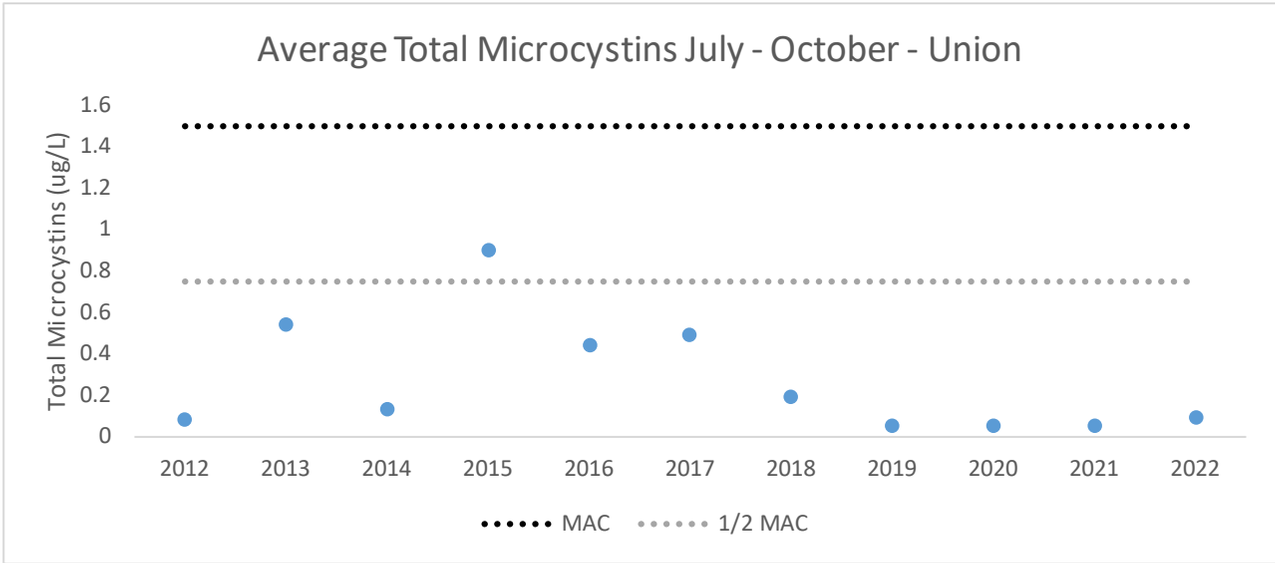


Figure 18 – Annual average concentration of total microcystins in the raw water at the Union drinking water intake from 2012-2022

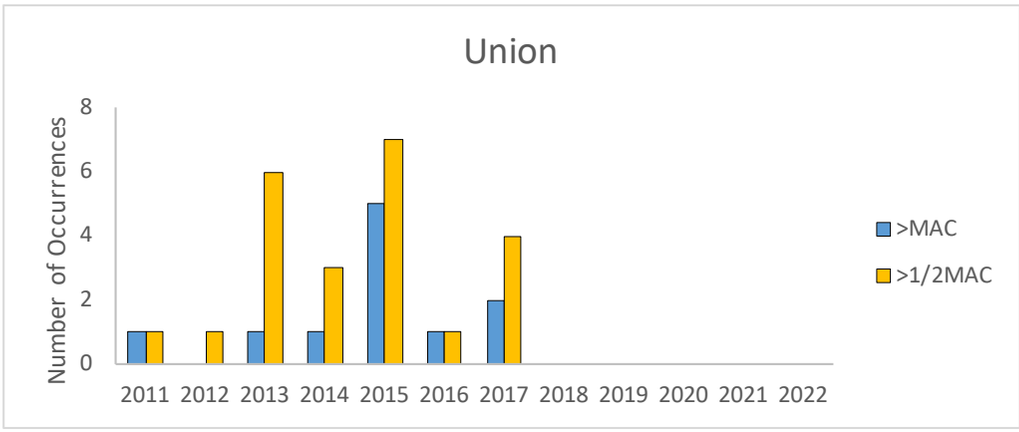


Figure 19 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Union drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration is typically below the ½ MAC with average concentrations between the ½ MAC and MAC in 2013, and 2015-2017. Importantly, since 2018 there have been no concentrations above the ½ MAC. There are two factors that should be considered – there was a change in the laboratory conducting the analysis in 2019, and Lake Erie has experienced less severe blooms in recent years.

The concern with the change in labs is illustrated by the graph below (Figure 20), which shows data reportedly from the same location collecting source water at the Union drinking water intake. Sampling dates are within 1 to 2 days of each other, but analysis is run either by the MECP through the DWSP program (orange line) or by a private lab (blue line). The difference between the data from nearby dates ranges from -0.17 to 4.85ug/L, with an average difference of 0.80ug/L.

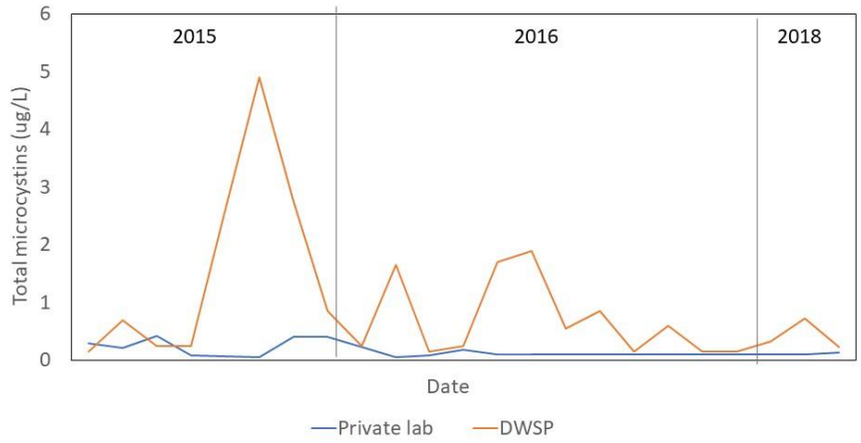


Figure 20 – Comparison of total microcystin concentration in the raw water at Union drinking water intake between the MECP lab through the DWSP program and a private lab. Dates for each pair of data are within 1 to 2 days of each other.

With these two confounding factors, it is difficult to say with certainty whether this is a data artifact or a true representation of conditions, however, visual and satellite observations provide support that concentrations were likely to be truly lower in recent years. Even though concentrations are lower in recent years, there is still a seasonal pattern and it is necessary for the WTP operator to monitor conditions.

- Concentration of total microcystin has been regularly seen at or above half maximum allowable concentration (½ MAC), although not in recent years
- Concentration of total microcystin been regularly seen at or above maximum allowable concentration (MAC), although not in recent years
- There is no trend in the annual concentration of total microcystin, but rather this is high variability depending on annual conditions
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB. The WTP has recently added treatment steps for redundancy
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake based on analysis conducted in 2014. This decision was confirmed at their meeting on September 13, 2023.

Pelee Island West Shore

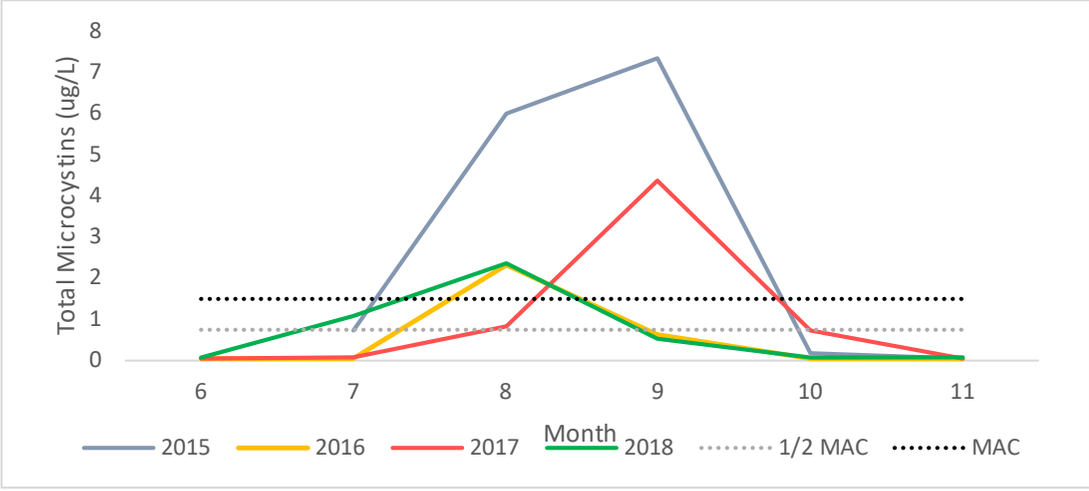


Figure 21 – Monthly average concentration of total microcystins in the raw water at the Pelee Island West Shore drinking water intake from 2015-2018

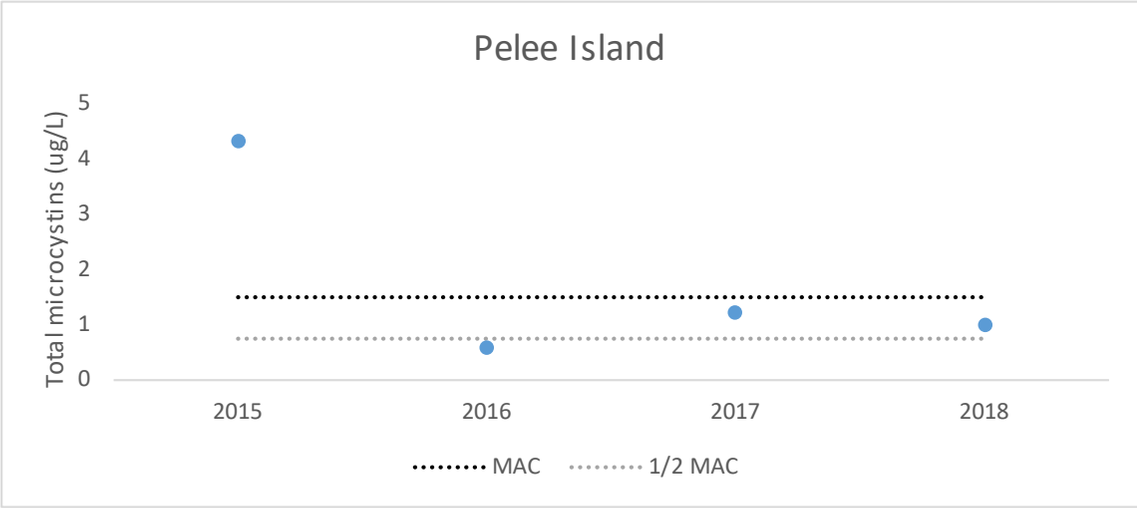


Figure 22 – Annual average concentration of total microcystins in the raw water at the Pelee Island West Shore drinking water intake from 2015-2018

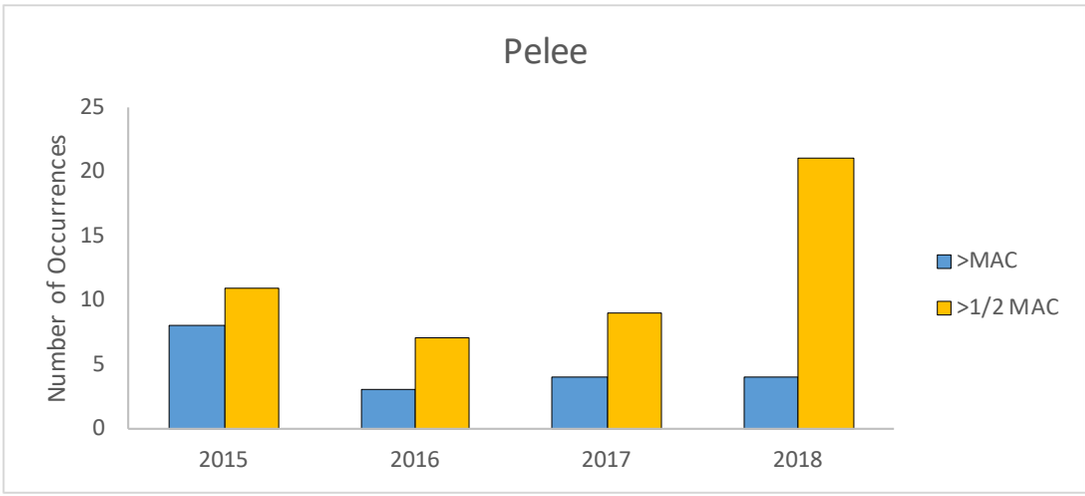


Figure 23 – The total number of occurrences when total microcystins concentration was above MAC or ½ MAC each year at the Pelee Island West Shore drinking water intake. Note that the number of occurrences >½ MAC includes the number of occurrences >MAC. There were no occurrences between 2018 and 2022.

Summary:

Average monthly total microcystin concentration during a HAB is often above the ½ MAC, with some monthly averages exceeding the MAC. The seasonal nature is clear with high concentrations during the summer months each year, which coincides with the timing of harmful algal blooms in Lake Erie. The number of individual occurrences above the MAC and ½ MAC was very high in all years with data for this intake.

Importantly, there are only data for 2015-2018 for the source water at this intake. During this time, the drinking water operator was taking samples directly from Lake Erie near the intake and from an access point within the WTP. While no treatment processes occur between these two points, water does pass through a natural sand filter. The operator at that time observed that total microcystin concentration was generally below detection at the access point, regardless of conditions in Lake Erie. Thich is confirmed by the data, which were collected on the same date by the same operator and analyzed at the same lab by the MECP (Figure 24). Research was recently completed at the University of Windsor to examine this phenomenon. It has been confirmed that a unique microbial community resides in the sand. The microbial community, through exposure to extremely high concentrations of microcystins, has developed a mutualistic, community-scale metabolic pathway by which microcystins are broken down (Salter, in prep). After 2018, analysis of total microcystins became the responsibility of the municipalities and was no longer included as part of DWSP. From 2019 onward, samples were only collected at the access point within the WTP, which is not representative of conditions in the source water. This was brought to the attention of the MECP and Township of Pelee in 2023. A thorough search for nearby data was conducted through consultation with research in both Canada and the US. Unfortunately, there are no supporting total microcystins data in the vicinity of Pelee Island between 2019 and 2022. An alternative method would be to examine satellite imagery in that

time frame, but that is beyond the scope of this report and satellite imagery cannot reliably be used at this time to estimate bloom toxicity.

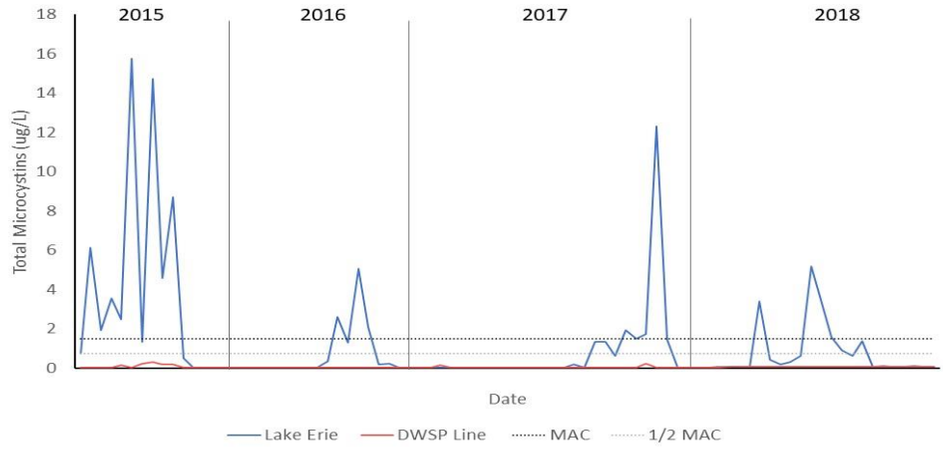


Figure 24 – Total microcystin concentration in Lake Erie (blue line) near the Pelee Island West Shore WTP and inside the same WTP after water has passed through a natural sand filter (red line). Samples were collected on the same day, but the same operator and analyzed by the same laboratory.

- Concentration of total microcystin is frequently at or above half maximum allowable concentration (½ MAC)
- Concentration of total microcystin is frequently at or above maximum allowable concentration (MAC)
- There are insufficient data to conduct trend analysis due to several years of missing data after 2018
- Elevated concentration of total microcystin occurs annually and display a seasonal pattern
- Drinking water operators reported that they monitor throughout the HAB season and must make alterations to the treatment process when a HAB is present. The WTP has a protocol in place and is well equipped to provide safe treated water during a HAB. The WTP underwent significant upgrades in 2015.
- The drinking water operator considers microcystin to be an operational concern

Decision:

The SPC determined that microcystin was a drinking water issue at this intake based on analysis conducted in 2014. This decision was confirmed at their meeting on September 13, 2023.

Summary and Conclusion

To be written

References

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Schindler, D. W. 1977. Evolution of phosphorus limitation in lakes. Science, 195(4275), 260-262.

Essex Region Source Protection Committee
Report 09/24

From: Katie Stammler, Source Water Project Manager
Date: Tuesday, October 29, 2024

Subject: Next steps – Assessment Report and Source Protection Plan for Early Engagement

Recommendation

THAT SPC Report 09/24 be received and further;

THAT the SPC support the submission of Chapter 4 of the Assessment Report and Source Protection Plan to the MECP for Early Engagement

Summary

- As part of the s.36 update, the Essex Region Assessment Report and Source Protection Plan must be amended to include all new and amended policies and technical work
- These documents will be submitted to the MECP for Early Engagement

Discussion

Further to SPC Report 07/24, the ERSPA received the following as part of the official response from the MECP on 11 September 2024.

- The modified EBA for Pelee Island Intake is proposed to extend to the areas circled below. Given the attached modelling summary exercise, please clarify how these areas have been added, i.e., demonstrate the pathway for how the spill would travel to the intake. If a spill occurs from the northeastern area (top-right circle), how would this travel to the intake and cause water quality deterioration? (See Figure 1)

ERSPA staff have reviewed previous documents and communications and have concluded that the area circled on the north-east part of the island was meant to be excluded based on the modelling results from Baird which did not result in contamination at the drinking water intake (See Figure 2). The other two circled areas were added as a result of using the corrected stream layer and/or changes to the limit of regulated area (See SPC Report 09/23). The circled area on the north-east side of the island will be removed from the EBA.

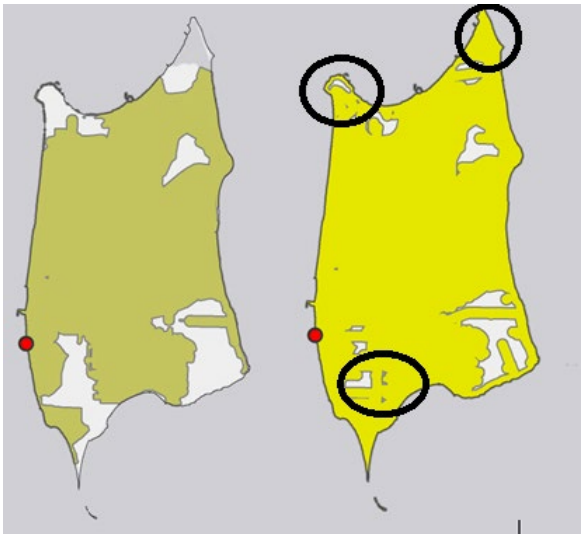

Figure 1 – Maps provided by the MECP showing areas where the delineation of the Event Based Area is in question.

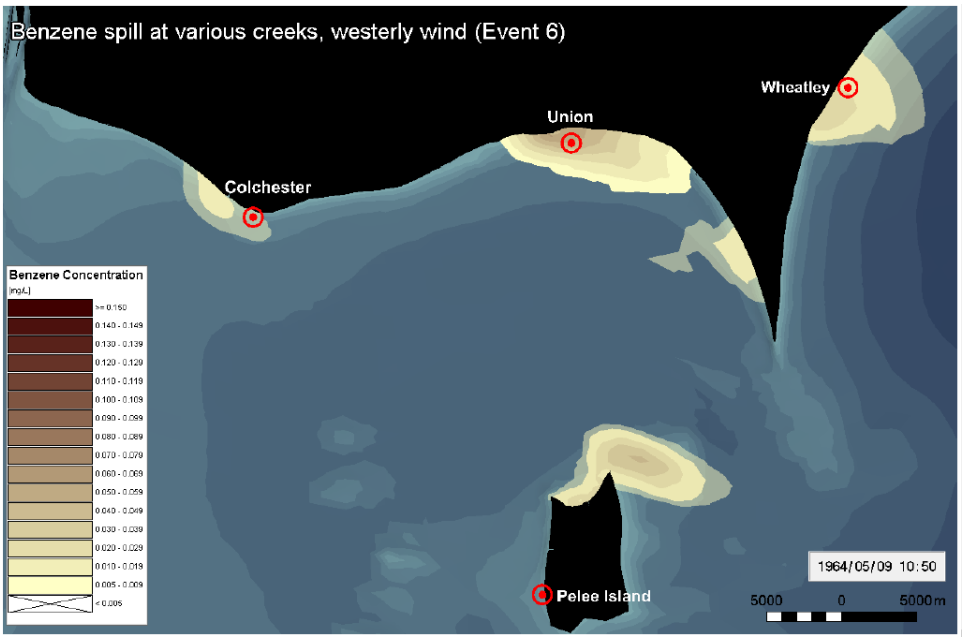

Figure 2 – Benzene concentrations for spills at all locations for Lake Erie intakes
Credit: Baird and Associates, 2013

Next steps

Over the last several months, ERSPA staff have been working on edits to Chapter 4 - Water Quality Risk Assessment - of the Assessment Report and the main body of the Source Protection Plan. These documents have been re-ordered and edited to meet AODA standards, and to improve readability and clarity. Amendments, additions and deletions have also been made to bring these documents in line with the work completed by the ERSPA and SPC over the last several years as part of the s.36 update. Final edits will be made based on the comments received from the MECP on September 11, 2024 and discussions with the SPC at their meeting on November 13, 2024. Following this, the documents will be provided to the MECP for Early Engagement. These documents will be provided to the SPC at the same time via email. Importantly, these documents are a culmination of the information the SPC has already received and/or approved.

Following this submission, ERSPA staff will begin the process of pre-consultation by meeting with municipalities to review policies that apply to them. This discussion will ideally be incorporated with a discussion on responding to the CLI-ECA requirements for sewage and stormwater and refresher training for Planning and Building staff implementing the written direction for s.59 training. This is expected to occur during the winter months of 2025.

RECOMMENDATION

THAT SPC Report 09/24 be received and further;
THAT the SPC support the submission of Chapter 4 of the Assessment Report and Source Protection Plan to the MECP for Early Engagement

Katie Stammler, PhD
Project Manager, Source Water Protection