St. Marys River AOC BPAC Meeting Minutes

Place: CC400, Algoma University
Sault Ste. Marie, Ontario

When: Monday March 2, 2020
6:30 – 8:30 p.m.

Call to order/introductions

Members	Jessica Wesolek, Brian Weslek, Don Marles, Klaas Oswald, Aubrey Maccoux-LeDuc, Paula Antunes, Mike Ripley, Al Wright, Peter Greve, Ron Prickett
Agency Reps	Mark Chambers (ECCC), Dawn Talarico (MECP), Ron Dorscht (MECP), Gurpreet Mangat (ECCC), Catherine Taddo (City), Lisa Derickx (AU)
Guests	Roger Santiago (ECCC), Kay Kim (ECCC), Danielle Milani (ECCC), Miranda Henning (Ramboll), Allison Glessner (Ramboll), Joanie McGuffin

Presentations

- Contaminated Sediment Management Strategy: St/ Marys River 2002-2018 – Roger Santiago, ECCC
    - We met with BPAC in 2019 and advised that the CSM will be updated. We are here today to present the CSM update and also to present our data and the outcome of the Canada-Ontario Decision Making Framework.
    - The draft CSM has been sent to BPAC for review and comments are requested by March 16th.
    - The 2006 results indicated that:
        - Bellevue Marine Park (BMP) - no further actions needed
        - East of Bellevue Marine Park (EBMP) - management action required at one station
        - Lake George Channel (LGC) - determine reasons for sediment toxicity at some sites
    - Based on 2006 results, additional samples were collected from EBMP in 2008, 2009, 2010, 2016 and in 2018 to assess the extent and magnitude of contaminated area in EBMP.
    - Samples were also collected from LGC in 2008, 2009, 2010 and 2016 to assess the extent and magnitude of contaminated area in LGC.
- St. Marys River Conceptual Site Model (CSM) Update – Miranda Henning & Allison Glessner, Ramboll
    - New studies have been integrated into the CSM
    - Progress since March 2019:
        - Concluded analysis of 2018 BEAST data
        - 2018 sediment and benthic invertebrate sampling results applied to the COA Framework
        - Updated draft CSM report to incorporate findings related to sediment chemistry, sediment toxicity, and benthic community structure in EBMP

- Goal of this presentation is to provide an update on current understanding of sediment-related risks in the St Mary's River
- Conceptual site models are used to understand sources of a chemical to the environment, how it moves through the environment, where it ends up, and what organisms and people may be exposed to it. Understanding all of these elements is important in order to make sure future actions, including measurements, are focused on the most important locations, chemical forms, and organisms.
- Ramboll is developing the CSM for the SMR based on data collected over the past ~15 years. Goal of CSM is to aid stakeholders in developing a contaminated sediment management strategy in the river.
- Human Health Risks: Quantitative risk assessment has not been conducted. Risks appear low due to low bioaccumulation potential of primary contaminants. Direct contact with environmental media from recreation (sailing, kayaking) most likely human exposure pathway. Anecdotal evidence indicates oil-contaminated floating material no longer present in river. Human health concerns are not a driver in sediment management strategy.
- Risks to Wildlife: Wildlife is not a risk driver in St Marys River
  - 2011/2012 study of breeding colonies of herring gulls and common terns within AOC. Contaminants (organochlorines, PBDEs, Hg) not adversely impacting reproductive success. Embryonic viability high within gull and tern colonies in AOC. Little evidence of impaired reproduction or deformities in gull or tern populations
  - 2013/2014 assessment of embryonic deformities in herring gull and common tern eggs. Frequency of deformities comparable between AOC colonies and downstream reference colonies
- Risks to Fish: Tumour rate only marginally exceeds RAP's delisting criteria of 5%. In addition to tumour studies, Parrott et al. assessed toxicity of AOC sediments on fathead minnows. Parrott et all collected surface sediment (0-5 cm) from 11 sites in 2016 based on results from BEAST studies (2002-2010). Chronic 21-day fathead minnow embryo-larval test – endpoints assessed included hatchability, hatch success, time to hatch, deformities at hatch, survival, weight, and length at 9 and 16 dph. Sediment from Algoma boat slip reduced larval survival and growth.
- Risks to Benthos: The benthic invertebrate community of SMR has largely recovered over the past three decades; management action suggested at 4 isolated locations, but they are small and isolated. Cleanup would disturb recovery that is underway. Evidence of benthic toxicity in 10 locations; literature review of case studies being undertaken to consider possible causes of toxicity.

- Benthic Conditions in the St. Marys River 2002-2018 – Danielle Milani, ECCC
  - Overview provided of ECCC's sediment assessment approach (BEAST) and the Sediment Decision-Making Framework.
  - Overview provided of sampling in SMR 2002, 2006, 2008, 2009 and 2010.
  - 2018 East of Bellevue Marine Park Study reviewed.
  - EBMP Conclusions:
    - Multiyear studies (2006-2010) in the SMR identified a depositional area known as East Bellevue Marine Park for sediment management actions.
    - In 2018, EBMP was revisited to examine spatial & temporal trends in sediment quality.
    - Sediment chemistry and benthic community structure results showed improvement over time and that that cleaner sediment is being deposited on top.

        - Toxicity was evident in EBMP and showed variable responses depending on the endpoint.
        - Improvement in toxicity was difficult to discern due to high variability, but some endpoints did show better survival, growth and reproduction in the 0-5 cm vs. the 0-10 cm sediment, whereas the opposite was not observed for the most part.
        - Additional 2018 studies (fish, *Hyalella* reproduction tests) showed no toxicity in EBMP and slight improved survival (*Hyalella*) in the 0-5 cm.
        - The Sediment Decision-Making Framework assessment for 2018 EBMP was that management actions were not required
        - The 2018 assessment showed improvement over previous studies (2008-10).
    - LGC Conclusions:
        - Sediment management actions required at 2 of 18 stations.
        - Further samples taken around these two stations indicated that management actions were not required. These are 2 isolated discrete areas (160 to 200 m apart).
        - Chemistry at these stations were elevated above Lowest Effect Levels but below Severe Effects Levels.
        - These stations had minor toxicity.
        - Toxicity observed at some stations that require "determine reasons for toxicity".
        - Technical Team recommended that no further action is required.
- BPAC questions and comments are appended to these minutes

Approval of Last Meetings Minutes
- January 30, 2020 – Approved as presented

Business Arising from Previous Minutes
- Draft letter to Noront regarding ferrochrome smelter – To be discussed at next meeting

New Business
- No new business

Memberships
- No new membership applications
- For new members, applications must be received & prospective members present for confirmation – standard procedure.

Binational Public Advisory Council (BPAC)

Feedback for ECCC/MECP

Re: Updated Conceptual Site Model (CSM) for the Canadian side of the St. Marys River

Re: Stage 2 Priority Sites and Recommendations

- I have concerns that any conclusion based on the data presented to us ignores the fact that there is evidence that not all sites are showing the same level of recovery. To make any conclusion as to the overall AOC requiring no management strategy ignores this evidence and is not tenable. I challenge the authors to demonstrate their conclusion given the facts that some sites need further investigation.
- I also challenge the authors to justify a conclusion they have given that fact that we all know if you investigate below the 10 cm mark the true nature of the sediment would be discovered. This reality cannot be ignored in any conclusion as to sediment management. Yes I understand the upper 10 cm is in good shape for most sites. But just describing the peel while ignoring the rest of the orange does not do justice to the orange.
- The effect of the runoff from the slag dump and the runoff from the dredged material from the boat slip is also not studied to determine the effect on the benthos in this area?
- I agree with the statement early in the document <Recovery is ongoing> and a strategy that deals with the existing deep seated sediment.
- I do not have a copy of the delisting criteria for the specific delisting of the degradation of Benthos BUI. Would be interested in what they are?
- I believe further monitoring and sediment disturbance management strategies must continue to be in place before we delist the degradation of Benthos BUI for SMRAOC.

- <u>Algoma Slip</u>
  - The recommendation is for post-dredging monitoring of the site. But, BPAC cannot comment on the remedial action at this site without knowing what was found in the latest dredging of the slip, and what if anything was found in the examination of the slip after the latest dredging was completed. We are still waiting for a report from Algoma Steel; it is currently scheduled to be released in March 2020. **BPAC cannot make any informed decisions regarding delisting this site until we are satisfied with the Algoma report findings**.

- <u>Slag Dump</u>
  - The recommendation is to continue monitoring the movement of leached materials, and treating the leachate. But I may have missed some information over the years, or just forgotten it; therefore I have questions whose answers would provide informed comments and decisions. 1. Just what is in the material that is leaching out of the slag dump and what is its toxicity? 2. While it seems there are methods to capture the leachate, how much of it escapes capture and enters the St. Marys River? The slag dumps will lie alongside the river forever; are there plans to continue monitoring and treating leachate for a hundred years or more? Who will be responsible for this if the steel plant shuts down and no longer exists? Is there a long-term plan? **BPAC cannot make any informed decisions regarding delisting this site until we are satisfied that these questions are answered.**

- <u>Bellevue Marine Park</u>
  - Generally, I am satisfied that in the area delineated by the sampling stations in the river, designated as "BMP", that no further action is required in that discrete area. But to alleviate long-term concerns, since sampling was done only to depths of 5cm at first, followed by sampling to 10cm after recommendations from BPAC, I recommend that some deeper sampling be done to determine the profile of contaminants in the river bottom; perhaps sampling a few stations down to 30 or 40 cm would provide some certainty to this question. **Here and at other sites downstream of Algoma Steel no sampling has been systematically carried out at depths below 10 cm; however we are aware that contaminants exist**

there, and that generally the concentration of contaminants increases as we sample deeper. These contaminants, of whatever kind and concentration, are not going away. Their existence must be addressed. BPAC cannot make any informed decisions regarding delisting this site until we know what is down there, what dangers it poses, and what long-term strategy is employed to deal with it.

- Lake George Channel
  - Out of 18 sampling stations in this subset of locations in the river, 12 were marked as either "Management Action Required" or "Determine Reasons for Toxicity". **This alone should prevent BPAC from any approval to delist**. In addition, we don't know what is present in the substrate below the 10cm level, and we owe it to future generations to find out.

- East of Bellevue Marine Park
  - Similar to the Lake George Channel, too many of the sampling stations here showed higher-than-acceptable levels of contaminants. **This alone should prevent BPAC from any approval to delist**. In addition, we don't know what is present in the substrate below the 10cm level, and we owe it to future generations to find out.

- Transport Canada Waterlot
  - The report indicates that this area of river was added "based on concerns from BPAC". However, aside from learning that one sampling station showed high levels of contaminants, we have not learned much about this area. We are aware that the heart of the problem area is the tributary ship channel that runs from the main mid-river ship channel to the Purvis Marine dock. But we have not been made aware how much of this side channel has been probed, and exactly where various levels of contaminants were found. Transport Canada has not been forthcoming with this information to BPAC, and it is not clear how much information has been forwarded to ECCC. Dredging this side channel carried out about 1990 revealed very high amounts and concentrations of contaminants, to the level that workers on the dredgeate barge should have been wearing hazmat suits. Currently, we have no information on how much of that kind of material remains in the channel, and how it is distributed. There does not appear to be any long-term management plan to deal with these materials. It is not clear that Transport Canada is coordinating with ECCC in the sampling protocols, materials testing, or management decision processes. **BPAC cannot make any informed decisions regarding delisting this site until detailed information is provided and we are satisfied that concerns arising from that information are answered.**

- River Use Concerns:
  - The Transport Canada waterlot and the East of Bellevue site are both heavily used by vessel traffic, commercial in the former and recreation in the latter. This also applies, but to a lesser degree to the Lake George Channel and Bellevue Park site. These areas are wide open to use by vessels. At any time, vessels in those areas can stir up the bottom with propeller wash, keels impacting on the bottom, or anchoring and anchor dragging. The ship channel to Purvis Marine will likely require dredging again; the Yacht Club will likely request dredging so that recreational sailboats can go in and out of the yacht basin. The buoyed channel to the Pine Street Marina, a site of heavy powerboat traffic, may require dredging. None of these are addressed in the report in terms of the potential for contaminants to be stirred up and redistributed, or dredged and redistributed; the St. Marys River is a dynamic environment whose currents will carry materials downstream and onto the top 5 cm of substrate. **A Sediment Management Strategy for the St. Marys River AOC cannot be drafted until all the facts are in, and potential future conditions and events are dealt with.**

- Extent of the St. Marys River RAP
  - The Contaminated Sediment Management Strategy addresses a small subset of the Area of Concern defined by the 1992 Stage One Remedial Action Plan report. The Canadian portion of the River as described in the Stage One RAP Report which extends from Gros Cap to Humbug Point on St. Joseph Island is the same area addressed in the designation of the river as Canadian Heritage River. Both Lake Little George and Lake George were cited in the Stage One Report as areas of known contaminant deposition. Two sediment core samples, each 60 cm in length, were taken from Lake George in 1986. The core samples along with others taken from the lake bottom were used to identify areas of heavy metal contamination and to determine the changes in industrial activity in Sault Ste. Marie. These areas were considered “Heavily” polluted with iron, zinc, lead, manganese, cadmium, nickel, copper, chromium, arsenic and oil and grease. Surprisingly, this information was not incorporated into the location of the Echo Bay water intake to the Environmental Centre. The Management Strategy should identify what is being dealt with and what is not.

- Depth of sediment samples
    - The Management Strategy indicates that in the East Bellevue Marine Park area the most recent deposited sediments tend to have lower concentrations than those deposited previously (>2.5 cm). Also there was no clear pattern of increasing or decreasing toxicity across depths of 0-5 cm vs 0-10 cm. The recent sediments would be expected to be less contaminated because of stricter environmental controls on point sources of pollution unless older contaminants had been resuspended downstream. Since the sediment sampling in recent work is confined to the upper sediments (10 cm or 4 inches or less) the recent survey work is not involving historical contaminants previously identified and buried at depth. During the meeting Environment Canada staff said that the sampling at 0- 5 and 0-10 cm is appropriate because there is no evidence of ice scour erosion of the surficial sediments. Yet, BPAC had a presentation by Ontario government staff (MNR and MOE) in the past concerning the threat of climate change and the strong possibility of contaminants being resuspended because of the potential of more intense cataclysmic storms, shifting of storm tracks further north and because lower river volumes coupled with deeper hull designs and larger, more efficient propellers would be expected to more frequently result in scouring the St. Marys River bottom. Research undertaken by Lake Superior State University has identified the effects of contaminant resuspension on anomalies in shore birds and aquatic fish species likely as a result of dredging within the river.

- Sediment – Related Risks Human Health
    - The Management Strategy determines that human health concerns are not a driver in the sediment management strategy because exposure is limited. This conclusion is based apparently upon the deposition of new uncontaminated sediment over the deeper known contaminated sediments deeper than 10 cm (4 inches) and because of restricted recreational access. The Bellevue Marine Park river segment however was ranked as the second worst contaminated location on the river. Work undertaken in 1995 by Kilgour, Morton and Kauss in this area provided estimates of the volume of contaminants including organic carbon, iron, oils and greases, other heavy metals, and polycyclic aromatic hydrocarbons (PAHs). The estimated mass tonnes (dry weight) was 138632.957. This huge amount of contaminants is a legacy of past practices and need to be identified as a management consideration even if they may be buried at depth. The organics were known to be lethal to people with skin sensitivities. Capping in situ might be a management consideration. In 1993, Dr. Tom Murphy indicated that there is considerable risk associated with some of the contaminants. Retene (a concentrated PAH) was identified as an example where there was little literature on the toxicity or biodegradation of the contaminant. The magnitude of risk from a status-quo “do-nothing” versus an aggressive remediation intervention is not clear. Perhaps science has advanced sufficiently to make a determination.

- When there is conflicting lines of evidence in EMBMP and LGC you make the statement that the core frameworks specify that high quality community structure studies outweigh the chemistry and toxicity lines of evidence. Why is chemistry overrun by upper level communities?

- I have an observation and some questions about the Transport Canada water lot that runs along the river to just downstream of the Purvis marine dock. I was on that water lot in 1990, when Small Craft Harbour (a division of what is now Transport Canada) conducted dredging in the area just downstream of the Purvis dock. That was the area where a lot of contaminants were found. The contaminants that were dredged into an open barge were a danger to human health and the fumes coming off the dredgate were very powerful. There was no sediment control in place during that process and a lot of that material went into the water column and river. I wasn’t particularly impressed with Transport Canada at that time and I am not so sure yet that I should be based on what you said about their sampling schedule that is currently in place. Personally, I am not sure that the one sample done at station 10 is sufficient to show if toxins are still present up and down the ship canal or just at the one station. Do you have any input into the dredging schedule and also exactly the manner of dredging that Transport Canada does?

- To my knowledge the last time that the ship channel leading into Purvis Marine was dredged would have been around 1990. My concern about this is that there are still contaminants in the bottom of that ship channel. When will dredging take place again and what kind of procedure would they carry out to ensure that the contaminated materials don't go into the water column and get redistributed downstream?

- There is a yacht basin east of Bellevue Park in the area close to what is called Top Sail Island. Currently the water levels in the St. Mary’s, as they are in all of the Great Lakes, are extremely high so there is no problem getting yachts in and out of the yacht basin. In years of low water there have been some applications for dredging in that

area. Given that management action is required in many of the test sites near the yacht harbour and also to any channel going into it would you recommend any dredging in that area?

- Some of the sites are marked as management action required and that would appear to infer some management is required, given that is how you have worded it would dredging in these areas be an issue?

- Were single samples collected or were there a few samples collected for each location that were homogenized? The reason for the question is that when you are sampling the GPS coordinates can be off by several meters and so even though you are at that location it can still be several meters from where you sampled last time. Just because there is one sample that has determined that it is not toxic at this point may be misleading. I would really like to see another sample taken at those locations to confirm those test results and even around that location.

- What is your planned approach for determining the reasons for sediment toxicity, as you have identified as being the next steps in some of your tables.

- Were there any efforts made to actually measure contaminant concentrations with the test initiation and test end just to make sure that they are stable and not being lost during the test?

- If you put enough sand into the river it will cover up all the evidence, like sweeping the dirt under the rug you have no problem, you throw some sand on top of the problem and it all goes away until there's disruption of the sediment layer.
- There still are toxins just under the surface of the cleaner sediments and I am going to suggest that dredging not be carried out in those areas. Dredging of any kind would stir up those sediments.

- For many of us we feel that once you get deeper than 10cm you are dealing with something that could be toxic, and that is why some of your samples show bias if you will or the tendency toward greater stress in terms of your application of your decision making tools.

- In regards to toxicity testing, the toxicity observed for *Hyalella* and the reference to the test water and sediment pH, I would caution you not to discard those results as being kind of a lab anomaly. I know that artifacts of toxicity testing can influence test results but you can have problems, for example with changes to redox potential during the test. Things like ion displacement from the sediment particles that can release ions into the sediment in core water that can change the pH as well as metal equilibration and dissolution and precipitation reactions. I wouldn't just discard that thinking that's an artifact of the test necessarily.

- We know from the previous studies in the 90s and 80s that there is a huge amount of toxic sediments that are still out there that are below the 10cm depth. 10cm is not very deep - an anchor or anything dragging along the bottom could expose any sediments below 10cm and I have to say that it is misleading of you not to say upfront that there are highly contaminated sediments that are still existing at the bottom of the St. Mary’s River. Why don’t you say that right up front? The 10cm layer may be clean, but underneath that is highly toxic sediments.