Niagara River RAP Beneficial Use Impairment (BUI)

Degradation of Benthos

Impaired

Status of BUI assessment:

- Assessment Completed and Peer reviewed.

Current Niagara River RAP Delisting Criteria:

1. When acute and chronic toxicity, community composition and abundance in the benthic community are similar to non-AOC reference sites.

2a. When benthic invertebrate tissue contaminant (PCBs and dioxin-like PCBs) concentrations are comparable in the AOC to those at a suitable non-AOC reference site for contaminants that biomagnify in the aquatic food chain, or

2b. in cases where benthic invertebrate tissue contaminant concentrations are greater than reference sites but are below concentrations considered to impair the beneficial uses associated with the consumption of fish and wildlife

3. OR if a contaminated site (as designated by the Niagara River Contaminated Sediment Technical Advisory Group) fails to meet the criteria described above in regard to degradation of benthos, then a Contaminated Sediment Management Strategy must be in place including a risk management approach with appropriate monitoring and mitigation measures and/or administrative controls.

Canadian/American AOC Comparisons: In the Niagara River (New York State) RAP, this BUI was designated as "Impaired". The RAP Summary (1994) stated that: "While benthos is not impaired in the main channel of the Niagara River due to the absence of fine grained sediments, impairment does exist at selected tributary mouths and nearshore areas."

Lead agencies: Environment Canada & MOECC for Lyons Creek East (LCE) and Transport Canada for Lyons Creek West (LCW).

What was the problem?

- The Stage 1 report (1993), Table A, stated that: "Benthos (sediment dwelling organisms) is relatively sparse in the Niagara River due to the lack of suitable substrate. However, in backwater areas of the Niagara River, the species abundance and diversity is unimpaired. In the Welland River, particularly the lower river below Welland and in other tributaries, benthic diversity has decreased to more pollution tolerant species. These have been linked to sediments with elevated metal concentrations. In three areas with extremely high metal concentrations, no benthic organisms exist."

What Do We Know?

- Phase I and II and III assessments of the sites provided the following results:
  - Remedial efforts would have marginal benefit at the Welland River at Geon (Oxyvinyl) and Port Robinson to Power Canal. Refer to AOC monitoring plan.
  - No further action is required at Sir Adam Beck Reservoir; Thompson's Creek; Frenchman's Creek; Black Creek Mouth; Pell Creek Mouth; Chippawa Creek; and Chippawa Power Canal.
  - A variety of possible sources precludes active remediation in the Niagara River at Queenston. Refer to NRTMP and other monitoring programs.
  - Further investigation or action not warranted in Niagara River at NOTL. Refer to NRTMP and other monitoring programs.
- Environment Canada prepared "Lyons Creek East Contaminated Sediment Baseline Monitoring", August 2011.
- According to EC's Baseline Monitoring, benthic invertebrate, sediment and water samples were collected in September, 2010. They are scheduled to be collected again in fall 2015.
- Caged mussel monitoring data analysis at LCE is described in Milani & Fletcher, 2006.
- Results from MOE's 2009 sediment monitoring using caged mussels at Boyer's, Miller and Baker Creeks indicated that Canadian sources of organic contaminants to the Niagara River had not been identified.
- MOE sampled in LCE and Cook's Mills in 2008/09 (sport fish) with some additional work done in 2010 to support the long-term monitoring of contaminated sediments.
- Environment Canada undertook a study on the degradation rate of PCBs. Estimates from literature reviews range from 41 to 109 years for maximum reduced toxicity. Risks to aquatic biota, fish-eating birds and mammals will diminish as dechlorination proceeds over time.
- The NPCA undertook a Sediment Transport Study in LCE. The study confirmed that there are a number of sediment sources to the creek, and, under normal flow conditions, there is negligible potential for sediments to be eroded and re-suspended.
- The City of Welland recognizes the unique situation at Lyons Creek East in its Official Plan (2010).
- Transport Canada, the lead agency for developing a management strategy for contaminated sediment at LCW, reported in July 2012 that it is abandoning any plans for the site for the next few years. This was again reported to Environment Canada in October 2014.

What Has Been Done?

- Chippawa Creek at Norton Company was remediated (dredged) in 1987 and documented in Acres International's 1989 report.
- Fourteen contaminated sediment sites were identified for further assessment and documented in the RAP Stage 1 Update report (1995).

- In fall 1991, a demonstration of contaminated sediment removal and treatment took place in the Welland River at Atlas Specialty Steels in Welland (and one of the 14 identified sites).
- In 1995, the Welland River "reefs" at Atlas Steels were remediated (dredged) and the project documented in reports by Acres.
- A post-remediation survey (Jaagumagi, R. 2003) following the Welland River Reef Cleanup project showed that benthic communities in the area of the reefs were becoming re-established at levels similar to the remainder of the river.
- The remaining contaminated sites were assessed and documented in Golder Associates' Phase I and Phase II report (2004), and a few sites were further assessed in the Phase III report (2005).
- Detailed Human Health Risk Assessments were carried out for the LCE and LCW sites and results documented in Dillon's reports (2007).
- Hydro One removed arsenic-contaminated sediment and soil from its property at LCW in September 2007.
- Monitored Natural Recovery (MNR) was the selected contaminated sediment management option for LCE, documented in Golder's Phase IV report (2008). This strategy includes administrative controls and a long-term monitoring plan.
- In 2011, the Administrative Controls Protocol for MNR of contaminated sediments at LCE came into effect. The NPCA is the lead coordinating agency.
- The RAP Coordinator drafted Part 1 (background) of the BUI assessment report and Golder Associates completed the technical BUI assessment (Part 2) in March 2013. The draft BUI assessment report peer review was completed in November 2014.

What Still Needs To Happen?

- The long-term monitoring plan is being finalized
- To initiate public consultation, a public guidance document will be released to summarize the BUI assessment reports. The guidance document will explain how the assessment for each of the "Impaired" BUIs were completed, provide the rational for the "Not Impaired" re-designation and how to obtain more information. Following consultation with all stakeholders and the public, the RAP Coordinating Committee will complete a final evaluation and recommend whether or not all BUIs have been remediated or restored, resulting in the "delisting" of the AOC. The final decision to delist the Niagara River AOC will then be made by federal, provincial, and local RAP participants, with advice from the International Joint Commission.

When Will The BUI Status Change?

- Anticipated 2017.

May 2016